Scientific American.

A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY AND MANUFACTURES,

Vol. XIV.—No. 9. (NEW SERIES.) | NEW YORK, FEBRUARY 24, 1866. | $3 PER ANNUM IN ADVANCE.

Improved Tile Machine.

This engraving represents a new and well-arranged machine for making drain tile. These are so universally adopted for carrying off waste water that a great demand exists for them.

The principal idea of this machine is to deposit the cement or material from which the tiles are made in a chamber or pug mill, A, where it is subjected to the action of a series of blades on the shaft, B. These blades are in form something like a screw propeller, and act similarly, forcing the material down toward the chamber, C, at the bottom. In this chamber there are two plungers worked by a crank shaft, D, said shaft being driven by gearing, E; one crank is out of sight. The cranks are set in line with each other, so that both are not forcing at once. This reduces the strain on the machine, as one plunger is commencing its stroke while the other is completing it.

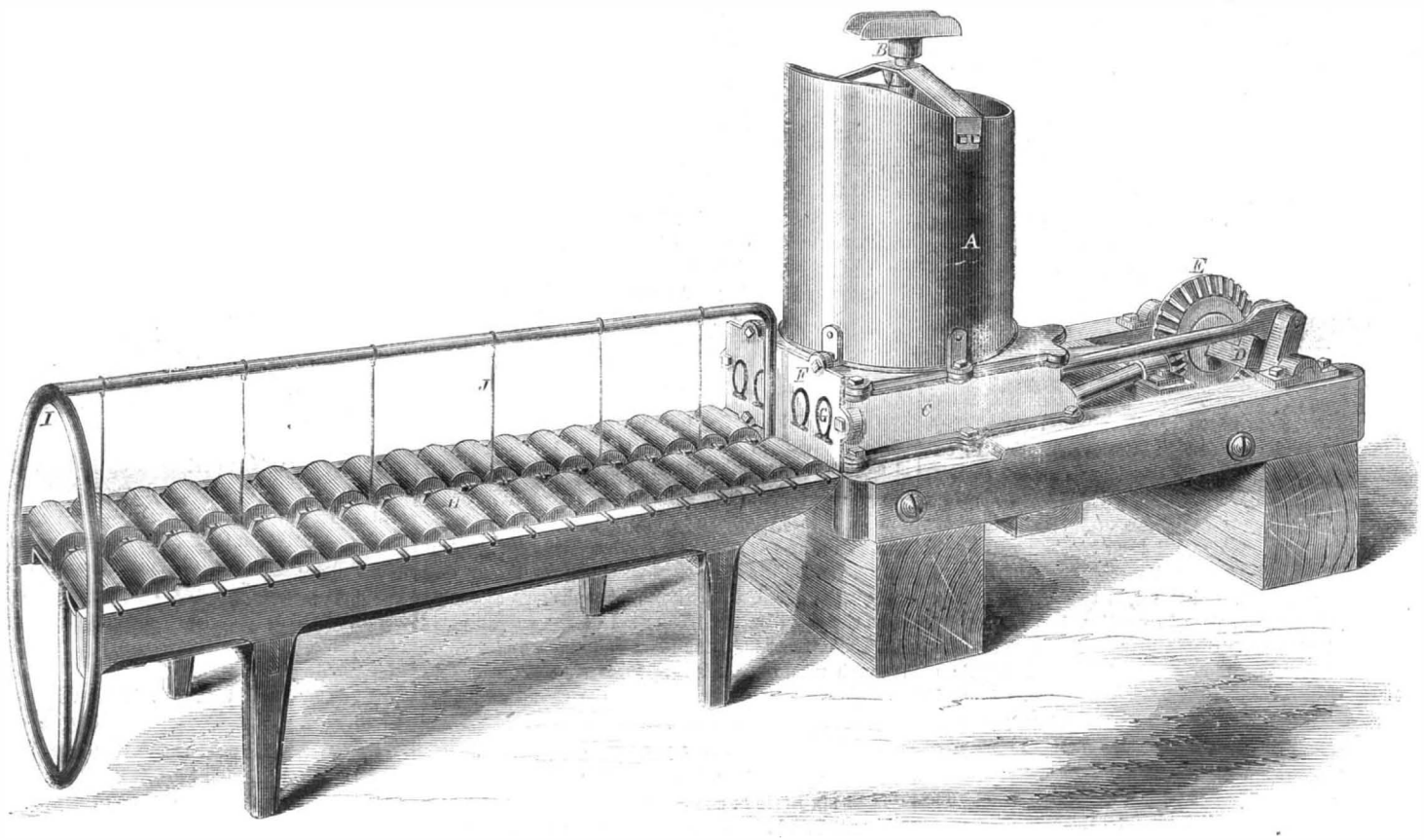
The shape of the tile is given by the mold apertures, F, at the end; the clay is forced through these and receives the tile form in that manner. The core, G, is supported by a bar inside, applied at its center; this is again attached to a transverse rod called a bridge bar. The latter is some distance from the core, so that the clay, after it has passed the bar, is enabled to close up again as it approaches the mold, thus forming a smooth, unbroken pipe.

As the tiles issue from the molds, they are received by the rollers, H, in connection with which there is a cutting-off apparatus, I. This consists of an iron frame with wires, J, on it. The frame is capable of being turned by a bearing, so that the wires will be brought over the tiles, thus cutting them off. When not in use, the frame and wires remain as shown in the engraving. The machine is intended to be driven by horse power through a sweep, as usual, but any power can be attached to the vertical shaft.

It will make 750 tiles or bricks per hour, with the labor of three men and two horses. The clay requires no preparation previous to being placed in the pug mill, except watering. The wires in cutting off pass between the rollers, so that no waste in the material is made, and the ends are left perfectly square.

The inventors are practical tile makers for upward of twenty years, and have tested this machine for two seasons at their works in Smyrna, Del., where it has proved satisfactory. It is strong and durable, and not liable to get out of order.

It was patented through the Scientific American Patent Agency on Sept. 26, 1865, by Josiah D. Evans, Thomas A. Collins and Thomas J. Smedley. For further information address them at Smyrna, Del.



EVANS, COLLINS & SMEDLEY'S TILE MACHINE.

New Photographic Process for Printing.

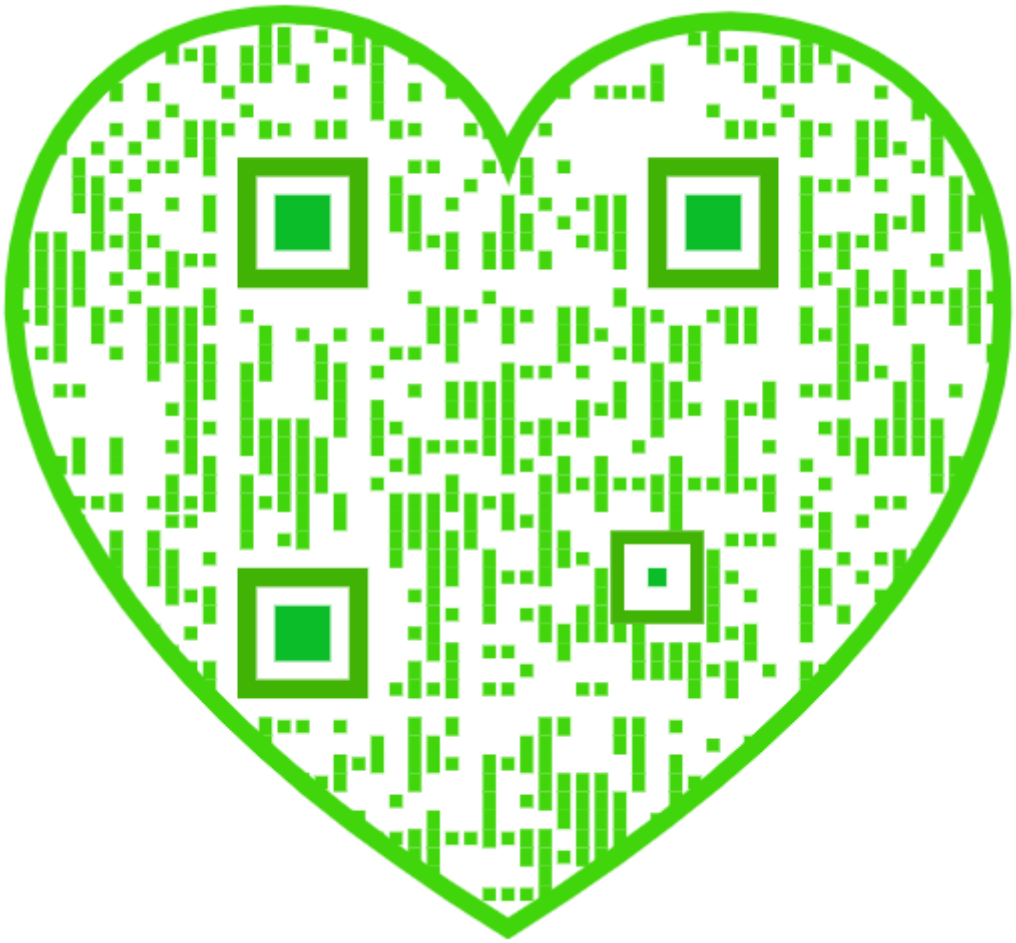
In all the ordinary methods of mechanical printing, gradation from light to dark is obtained by the use of lines or dots, which, having finer or broader surfaces, and being ranged in close proximity or spread wide apart, the spaces between being absolutely white, give the effect of the lightest tints or the deepest shades. This is the case whether the ink be applied to the portions in relief of a woodcut, to the hollows of a copper-plate, or to the portions of a flat surface for which it has affinity on a lithographic stone. The ink is, in each instance, opaque, and gradation is only obtained by breaking its continuity of surface with small spaces of white. In photographic printing, gradation is obtained by different depths of a continuous tint, resembling in effect, successive washes of a transparent pigment in water-color painting. The difficulty of reproducing this by mechanical means has been the obstacle in all attempts at photo-engraving, photo-lithography, or photo-block printing, and it has been for some time past admitted that the only means of success in this direction would consist in a method of translating the half-tone of gradation of tint into the half-tone of grain or stipple.

In Mr. Woodbury's photo-relief printing, the end is secured without any such translation; the picture is produced with every gradation of a continuous tint, and by mechanical printing, sufficiently rapid to compete with copper-plate or lithography. To do this, however, it has been necessary to introduce a distinctly new principle into printing operations, and to prepare a plate which should apply or give up to the paper different proportions, in different parts, of a semi-transparent ink, according to the depth of tint required by different portions of the picture. This is the problem which Mr. Woodbury has solved, and we may remark, in passing, that we see no reason why the same principle might not find valuable application in the ordinary process of printing from engraved intaglio plates.

Mr. Woodbury's photographic intaglio is very simply obtained. The image in relief having been produced by the action of light through a negative on a film of bichromated gelatin, this gelatin relief becomes the matrix from which an indefinite number of metal plates, in intaglio, may be produced. The metal used resembles type-metal. A plate of this metal, about a quarter of an inch thick, with a perfectly plane surface, is placed in contact with the gelatin relief, and subjected to hydraulic pressure, by which a perfect transcript of every gradation in the gelatin is produced on the metal. Notwithstanding the softness of the metal, but slight trace of wear or deterioration is observed after some thousands of impressions have been taken from a plate. If the plate needed to be cleaned for each impression, like the copper-plate, or if it were necessary to submit it, in printing, to a heavy or rolling pressure, it would doubtless be necessary to subject it to some hardening process; but the pressure being light and steady, this is not necessary. The process, moreover, of producing a new plate from the gelatin relief is just as simple and easy as producing a print on paper.

The method of printing is easier than any other

© 1866 SCIENTIFIC AMERICAN, INC.



with which we are familiar. In the various modes of photographic printing—except the collodio-chloride—several operations are necessary to render the paper sensitive to light, and several others are required to tone and fix the image when obtained. In the various mechanical printing processes, some skill and care are requisite to keep the ink properly distributed on the roller, and to transfer it from the roller evenly to the surface of the plate or stone. But in the new method of printing, a little of the ink—which consists of a warm solution of gelatin and lamp-black, with a little crimson lake—is poured on the surface of the plate, where it stands in a little pool in the center; upon this the paper is placed; the platen is brought down, giving the slight pressure necessary, which at once spreads the ink over the surface and drives off at the edges all that is not required to form the picture. In a few seconds the gelatin has congealed, and the paper, being lifted up, brings with it all the ink from the depressions on the plate. The printing is indeed rather a process of casting than of printing as ordinarily understood, and the picture is a relievo in colored gelatin, taken from a very shallow metal intaglio. As the gelatin dries, it of course contracts, and the finished picture shows very little effect of relief or impasto. As the coloring matter is carbon, the permanency of the pictures is tolerably certain.

If the picture were left in this state it would be readily liable to injury from moisture, although not more so than a water-color drawing, which is not usually regarded as a very unstable form of art. But it will be obvious that there are various modes of rendering a film of gelatin insoluble. Mr. Woodbury has, during the last few months, tried several of these, but has not found any so simple and effective as immersing the print in a solution of strong alum. This at once renders the film insoluble, and, when dried, it is impervious to moisture, and little liable to mechanical injury.

The possible rate of printing remains yet to be absolutely determined. With the mechanical appliances improvised for experiment, and the amount of manual skill obtained in the prosecution of experiments, Mr. Woodbury has been enabled to produce, single-handed, one hundred and twenty prints in an hour. In the production of several thousands required for our readers, all the experience and skill necessary in the successful working of any process had to be acquired, and the last two or three thousand are not only better in quality, but have been produced with more ease than the first two or three thousand. In each day's work with one pair of hands there are necessarily many interruptions, in preparing fresh ink and paper, clearing away accumulated prints, etc., but we find the smallest number produced in a day's work of six hours and a half to have been 403 prints, and the largest number in the same time 560 prints. With a little practice and a large number of presses at work, which might easily be managed, we see no reason why the rate of production should not be at least doubled.—*London Photographic News.*

Record of Boiler Explosions.

Explosion of three boilers at Columbia, Pa. Two men killed and three wounded. "No cause known!"

Jan. 9th.—Locomotive New Jersey Central Railroad exploded. Three men killed, two wounded. "No cause assigned!"

Jan. 19th.—Boiler exploded in Baltimore, Md. Three men injured. "No cause!"

Jan. 29th.—Boilers of Carhart & Needham's Melodeon Manufactory, 23d street, New York. "Boiler overheated by sudden falling of water—flues expanded, forcing out heads and breaking many rivets."

Jan. 30th.—Locomotive Boston and Lowell Railroad exploded while at rest. One killed and two wounded. "No cause ascertained!"

Jan. 30th.—Terrific explosion on Ohio River—steamboat *Missouri* destroyed. One hundred killed. "No cause determined!"

Jan. 30th.—Awful explosion of steamboat *Miami*, sunk in Arkansas River. Two hundred and twenty-five killed! "No cause known!"

Jan. 31st.—Explosion of locomotive on the New Orleans and Jackson Railroad. Three killed and four wounded. "No cause ascertained!"

Feb. 2d.—Fearful explosion of steamboat *W. R. Carter*, on the Missouri River. One hundred and fifty killed. "No cause known!"

Feb. 3d.—Steamboat *Baltic* exploded boiler while leaving dock at New Orleans. Three killed, seven wounded. "Nobody to blame!"

Feb. 3d.—Explosion of boiler in mill at Petersburg, Va. Six killed, seven wounded. "No cause known!"

[Some friend has forwarded this record with a remark at the head—"Continued from Jan. 5, 1866." We have not received any previous account.—Eds.

MISCELLANEOUS SUMMARY.

There are now two daily papers at Denver and two more in the mountain region. The section in which lumber is found in Colorado has twenty-five saw-mills, and ten flour mills have been set up within the past few years. The quartz mills in the State are counted at over 150, costing $40,000,000. They should average, if all were running on medium ores, not less than $23,000,000 per year. Wages rule at $5 per day. Mr. Loveland, a resident of Golden City, is soon to erect a blast furnace and rolling mill at that point. The mill is to turn out rails for the road that is to be constructed between Denver and the towns of Central and Empire, passing through Golden City, and probably furnishing one of the many links in the overland railway to the Pacific.

At a recent meeting of the Royal Society of Edinburgh, Sir David Brewster exhibited a piece of amber from the Kingdom of Ava, weighing about two pounds and a half. The specimen is remarkable in that it is intersected in various directions by thin veins of a crystallized mineral substance. These veins are, in some parts of the mass, as thin as a sheet of paper, and in other parts about the twentieth of an inch thick. An examination of a portion of the thickest vein has proved the mineral to be carbonate of lime. Pieces of amber of two and three pounds weight are rare. A specimen in Prussia, weighing one pound, is valued at fifty dollars. The largest piece yet found is in the Royal Museum at Berlin; it weighs eighteen pounds, and is said to be worth upward of several thousand dollars.

Vanilla.—A successful effort, it is said, has been make to raise this plant in France. The experiment was made in the public gardens of the St. Bruno, and the quality is affirmed to be equal to the best imported from the West Indies. The seed of the vanilla is remarkable for its fragrant odor, and yields an oil which is much used as a flavor. It is also employed in medicine in place of valerian, all the virtues of which it is supposed to possess, while it is at the same time far more grateful to the taste.

To Blacken Zinc Statues, Etc.—Make a solution of six parts of chloride of antimony in one part of alcohol and four parts hydrochloric acid, and apply it to the object with a brush. Wipe the figure over with a wet cloth, and then apply the solution a second time. Now dry the object as quickly as possible in a warm place. When it is perfectly dry rub it all over with oil.—*Deutch. Illust. Gewerbzig*, 1864.

The commerce of the Mississippi river employs 910 steamers, with a capacity of 272,144 tuns, valued at $24,556,600. St. Louis has 210 steamers, with a capacity of 110,769 tuns, valued at $8,830,000. The next principal port is Cincinnati, 150 steamers; New Orleans, 81; Pittsburgh, 78 steamers and 81 tugs; Louisville, 66; Memphis, 60; Wheeling, 44; St. Paul, 39.

The Agincourt's Engines.—Probably the greatest indicated power ever yet exerted in a single pair of engines, was that attained on the recent trial of the *Agincourt*. With a nominal power of 1,350 horses, the indicated horse-power was 6,867. With half boiler power, 3,115 indicated horse-power was obtained. The full piston speed, with 61½ revolutions per minute, and 4 feet 4 inch stroke, was 533 feet per minute.

Surgeon C. W. Walsh, in a letter to the *Medical Times and Gazette*, states that he has found two grains of oxalate of cerium and one drachm of compound tincture of valerian invariably gives great relief in sea sickness. The dose may be administered at intervals of thirty minutes.

The great Cincinnati bridge about to be suspended across the Ohio River will be the longest in the world, being over 2,000 feet longer than the Suspension Bridge over the Niagara River, and 540 feet longer than the Menai Bridge in England. Its total span will be 1,057 yards. The massive stone piers tower 110 feet over the floor of the bridge, and 200 feet above their foundations. One year is the period allowed for building it.

There are nine establishments in Massachusetts for the manufacture of spool cotton—three in Bristol County, four in Essex, and one each in Hampden and Plymouth. The value of stock used and of spool cotton made, capital invested and hands employed for the year ending on the 1st of May 1864, was as follows:—Stock used, $865,538; value of cotton made, $1,336,098; capital invested, $990,500; hands employed, 867.

The *Gazette des Hopitaux* points out a method of curing coryza (cold in the head) with rapidity. It consists in inhaling the tincture of iodine, a vial of which is to be held in the hand and placed under the nose. The warmth of the hand causes the vaporization of the tincture. The inhalations are to be made every three minutes, and soon all symptoms of the malady will disapear.

There are in operation in Windham and New London Counties, Conn., 57 cotton mills, having a capacity of 426,881 spindles and 8,094 looms. During the last year the said mills manufactured into goods 20,485,540 pounds of raw cotton. There are now in the course of erection six new mills that are to have a capacity of 112,468 spindles and 2,872 looms.

The velocity of sound in common river water, at a temperature of 15 deg. Centigrade, is 4,700 feet a second, while at a temperature of 30 deg. Centigrade it is 5,000 feet a second. In solids, the velocity is generally much greater than in liquids. In fire wood, for example, it is 15,000 feet a second; in iron, it is 17,000; in lead, however, it is only 4,000 feet a second.

M. Pleateau's experiments show that the muscular force of insects compared with that of the vertebrates is enormous. The common cockchafer is capable of exerting a tractile force equivalent to fourteen times the weight of his body, while the drawing power of a horse is only ·67 of his weight.

The Meriden *Recorder* states that Elliott Savage of Meriden, lately received a patent for a new process of hardening iron, which he sold to Jedediah Wilcox for $500,000, and that Mr. Wilcox has sold it for $2,000,000.

The Boston *Traveler* states that E. M. Stephens has sold his patent rubber heel stiffening to a company now organized under the laws of Massachusetts for the manufacture and sale of them, for the large sum of $300,000.

The large bolt factory of the S. Stow Manufacturing Company, at Plantsville, Conn., has been destroyed by fire. A large number of persons are thrown out of employment.

Last year 6,924,168 gallons of malt liquor, were manufactured in Chicago. Thousands of barrels were shipped to Wisconsin, Michigan and Iowa, and tens of thousands to various parts of Illinois.

Herr Krupp, the cast-steel manufacturer at Essen, Prussia, is about to set up a steam hammer of 2,500 cwt. Of the thirty-four steam hammers at work upon his premises, the heaviest is not above 1,000 cwt.

Smeaton ascertained that the effective power of a windmill with sails of the best form, and about 15½ feet radius, with a breeze of 13 feet per second, is about 1 horse-power.

The whole of the sewerage system of Woolwich is to be connected, for ventilating purposes, with the tall shaft of the steam factory department, and remarkable sanitary results are expected.

The velocity of the sound wave in air of the freezing temperature is 1,090 feet a second. The velocity of sound in air increases 1·6 feet for every degree Centigrade of temperature.

The presence of ozone in the atmosphere is a subject of dispute. A commision has been appointed by the Academy of Sciences to decide the question.

© 1866 SCIENTIFIC AMERICAN, INC.

Liebig on Coffee.

To the *Popular Science Review* Baron Liebig contributes a highly suggestive article on coffee, from which we take the following extracts:—

"If the raw berries are boiled in water, from 23 to 24 per cent of the soluble matter is extracted. On being roasted till they assume a pale-chesnut color, they lose 15 to 16 per cent, and the extract obtained from these by means of boiling water is 20 to 21 per cent of the weight of the unroasted berries. The loss in weight of the extract is much larger when the roasting process is carried on till the color of the berries is dark brown or black. At the same time that the berries lose in weight by roasting they gain in volume by swelling; 100 volumes of green berries give, after roasting, a volume of 150 to 160; or two pint measures of unroasted berries give three pints when roasted.

"The usual methods of preparing coffee are, 1st, by filtration; 2d, by infusion; 3d, by boiling.

"Filtration gives often, but not always, a good cup of coffee. When the poring of the boiling water over the ground coffee is done slowly, the drops in passing come in contact with too much air, whose oxygen works a change in the aromatic particles, and often destroys them entirely. The extraction, moreover, is incomplete. Instead of 20 to 21 per cent, the water dissolves only 11 to 15 per cent, and 7 to 10 per cent is lost.

"Infusion is accomplished by making the water boil, and then putting in the ground coffee; the vessel being immediately taken off the fire and allowed to stand quietly for ten minutes. The coffee is ready for use when the powder swimming on the surface falls to the bottom on slightly stirring it. This method gives a very aromatic coffee, but one containing little extract.

"Boiling, as is the custom in the East, yields excellent coffee. The powder is put on the fire in cold water, which is allowed merely to boil up for a few seconds. The fine particles of coffee are drank with the beverage. If boiled long, the aromatic parts are volatilized, and the coffee is then rich in extract, but poor in aroma.

"As the best method, I adopt the following, which is a union of the second and third:—

"The usual quantities both of coffee and water are to be retained; a tin measure, containing half an ounce of green berries, when filled with roasted ones, is generally sufficient for two small cups of coffee of moderate strength, or one, so called, large breakfast-cup (one pound of green berries, equal to sixteen ounces, yielding after roasting 24 tin measures [of one-half ounce] for 48 small cups of coffee).

"With three-fourths of the coffee to be employed, after being ground, the water is made to boil ten or fifteen minutes. The one-quarter of the coffee which has been kept back is then flung in, and the vessel immediately withdrawn from the fire, covered over, and allowed to stand for five or six minutes. In order that the powder on the surface may fall to the bottom, it is stirred round; the deposit takes place, and the coffee poured off is ready for use. In order to separate the dregs more completely, the coffee may be passed through a clean cloth; but generally this is not necessary, and often prejudicial to the pure flavor of the beverage.

"The first boiling gives the strength, the second addition the flavor. The water does not dissolve of the aromatic substances more than the fourth part contained in the roasted coffee.

"The beverage when ready ought to be of a brown-black color; untransparent it always is, somewhat like chocolate thinned with water; and this want of clearness in coffee so prepared does not come from the fine grounds, but from a peculiar fat resembling butter, about twelve per cent of which the berries contain, and which, if over roasted, is partly destroyed.

"In the other methods of making coffee, more than the half of the valuable parts of the berries remains in the 'grounds,' and is lost.

"To judge as favorably of my coffee as I do myself, its taste is not to be compared with that of the ordinary beverage, but rather the good effects might be taken into consideration which my coffee has on the organism. Many persons, too, who connect the idea of strength or concentration with a dark or black color, fancy my coffee to be thin and weak, but these were at once inclined more favorably directly I gave it a dark color by means of burnt sugar, or by adding some substitute.

"The real flavor of coffee is so little known to most persons that many who drank my coffee for the first time doubted of its goodness, because it tasted of the berries. A coffee, however, which has not the flavor of the berry is no coffee, but an artificial beverage, for which many other things may be substituted at pleasure. Hence it comes that if to the decoction made from roasted chicory, carrots, beetroot, the slighest quantity of coffee be added, few persons detect the difference. This accounts for the great diffusion of each such substitute. A dark mixture, with an empyreumatical taste, most people fancy to be coffee. For tea there are no substitutes, because every body knows what real tea is like."

PATENT-OFFICE DECISIONS.

BEFORE THE EXAMINERS IN CHIEF, ON APPEAL.

Elisha Foote, for the Board.—The invention of G, patented in September, 1856, was one of several devices that have been produced to lower and raise the cutters in harvesting machines, and make them convertible into either reapers or mowers. The general form of his frame may be compared to a triangle, with the main driving wheel at the base and the finger bar extending out from its apex. That part of the frame which immediately supports the driving wheel is made separate from the rest, and may be attached to it at any desired angle, so that when the apex is raised or lowered the wheel may be set in a perpendicular position.

At the outer end of the finger bar is a smaller wheel connected with it by two arms with slots and bolts, by which the hight of the finger bar may be adjusted. And at the inner end of the bar at the apex of the frame is another joint by which the cutter bar may be made horizontal, whatever may be its hight.

These three joints are essential to the invention. One to adjust the hight of the finger bar, another to make it horizontal and another to set the driving wheel perpendicular, and without them, all combined, no improvement would have been effected.

It is manifest that these several parts constitute but one invention and effect but one object, to wit, the adjustment of the cutters. Separate and by themselves they are of no practical importance.

By the reissue it is sought to surrender the one original patent for the invention, and have four issued in its stead. And the first question that is presented to us is, whether it is legal and proper to thus divide the invention into four separate parts and issue a patent for each? By the patent A is claimed the combination of the cutting apparatus and that part of the frame, that supports the driving wheel; by patent B the cutting apparatus and the driving wheel; by patent C the cutting apparatus and the two parts of the frame, and by patent D the two parts of the frame. Different parts of the joint in the frame are claimed in three patents, and of the joint at the apex, in two patents, and thus different parts of a simple invention are divided into altogether four patents and thirty-six claims.

There may be and often are, several and distinct inventions relating to the same subject matter. The different parts of a steam engine, for example, the valves, pistons, pumps, etc., may all be subjects of distinct inventions, each of which may be used without any dependence on the others. And should the same person make two or more such inventions he may, as he pleases, have one patent for them all, or a separate patent for each. But for a single invention our patent laws never contemplated more than one patent. The statute directs that the applicant shall fully set forth his invention, explain its principle and the several modes of its application, point out the part that is new, and for that, if sufficiently important, he is to receive, not patents, but a patent. A practice of dividing patents has of late grown up which, it is believed, is neither sanctioned by law or conducive to any public interest. The present case is perhaps an extreme one, but it strongly illustrates the impropriety of such a course. A person might purchase a patent professing to be for an invention and acquire no right to it. Indeed four different persons might each of them do so and none of them obtain it. The owner of A would acquire the right to combine the cutting apparatus with a part of the frame; but of what use would that be unless he could also combine the driving wheel—the exclusive right which would be secured to B, and the other part of the frame which would be exclusively secured to C? And what would be the value of B's right to the combination of the cutting apparatus and driving wheel without a right to use the frame also by which they are supported? C's right would be but an absurdity without the parts that would be secured to others; and all united would be entirely useless without the details exclusively claimed by D.

A patent for that which is of no value—a patent that is not for an invention, but for some of the parts only of which an invention is composed—is opposed to all our views of patent laws. We concur with the Examiner in opinion that a reissue in the form proposed should not be allowed.

We are also of opinion that the applicants have not sufficiently shown a loss of the patent, to authorize a reissue without its surrender. The statute under which we act authorizes a reissue only when there is a surrender. The object was that there should not be two patents in existence for the same invention. If a loss is to be regarded as an equivalent to a surrender, and as substantially answering the purpose of the requirement, it must be clearly and satisfactorily shown. The evidence in this case, that the patent was in the hands of an attorney who had died, falls entirely short of the requisite proof. The fact is not inconsistent with the idea that the patent may be found by an adequate search.

As the conclusions to which we have arrived will require a remodeling of the application and considerable changes of the claims we have not deemed it necessary to go into a consideration of the numerous questions that arise upon them.

The decision of the Examiners is affirmed.

Application of Albert Seymour for a reissue of the patent granted to him Nov. 15, 1864, for a Tree Protector.

The Board, by S. H. Hodges and Elisha Foote.—Upon filing his present application the petitioner described his invention as a trough extending around the tree, and a shed extending over and beyond it. In the first letter of rejection he was told where such troughs were in common use, embracing all he claimed. He did not deny this, and it must be taken as true.

But he amended by claiming the same thing when made in sections of cast metal.

Neither of these expedients involves any invention. The change of material has repeatedly been held not to be of itself entitled to a patent. (Hotchkiss *vs.* Greenwood, 11 How. R., 248.) Dividing a fabric into sections is what every one is entitled to practice, and no one has a right to monopolize it.

The decision of the primary Examiner is affirmed.

SPECIAL NOTICES.

Moses G. Farmer, of Salem, Mass., has petitioned for the extension of a patent granted to him on the 4th day of May, 1852, for an improvement in electro-magnetic alarm bells.

Parties wishing to oppose the above extension must appear and show cause on the 16th day of April next, at 12 o'clock, M., when the petition will be heard.

William Southwell, of West Cambridge, Mass., has petitioned for the extension of a patent granted to him on the 4th day of May, 1852, for an improvement in machinery for grinding or polishing saw blades, etc.

Parties wishing to oppose the above extension must appear and show cause on the 16th day of April next, at 12 o'clock, M., when the petition will be heard.

Peter Dorsch, of Schenectady, N. Y., has petitioned for the extension of a patent granted to him on the 15th day of June, 1852, for an improvement in cast-iron car wheels.

Parties wishing to oppose the above extension must appear and show cause on the 28th day of May next, at 12 o'clock, M., when the petition will be heard.

An Oil Well on Fire.

The Meadville *Republican* says that an oil well recently caught fire near that place and thus describes its appearance:—

"Imagine a space perhaps forty feet square sending up a solid sheet of flame nearly sixty feet in hight. It lights up the country for miles around, so that one can see to read a newspaper at a distance of four or five miles. The heat of the fire has started vegetation to growing, and grass can be plucked there as green as that found in summer time. The well is owned by parties at Rochester, N. Y., and was struck some four years ago. It commenced flowing oil and water with a very strong force of gas, and the owners were confident that they had a good well, but two weeks ago, the men going to supper, the well took fire—it is supposed from the engine—and has been burning ever since. The flame when first discovered was coming out of the driving pipe, and was not more than three or four feet in diameter; but, after burning two or three days, the driving pipe was melted off two or three feet, and thus allowing the gas and oil to separate before reaching the top spread over a surface thirty or forty feet square. It has burned ever since without cessation.

"Sometimes the flame will reach to the hight of one hundred feet, enlivening the trees which crown the summits of the surrounding hills, and the reflections against the sky produce an effect which no pen can describe or pencil do justice to."

MR. DONALD MCKAY, the Boston ship builder, has just returned from a tour in England, and has published an article in the Boston *Commercial Bulletin*, wherein he states that, after having examined all the English and French iron-clads, he has come to the conclusion that our vessels, especially the *Dunderberg*, are superior to all.

WORK on the Hoosac tunnel, which was suspended last fall on account of the flow of water, has been resumed again. The new shaft has been sunk forty feet, and the central shaft two hundred and twenty-five feet.

© 1866 SCIENTIFIC AMERICAN, INC.

LOCOMOTIVE FOR THE MONT CENIS RAILWAY.

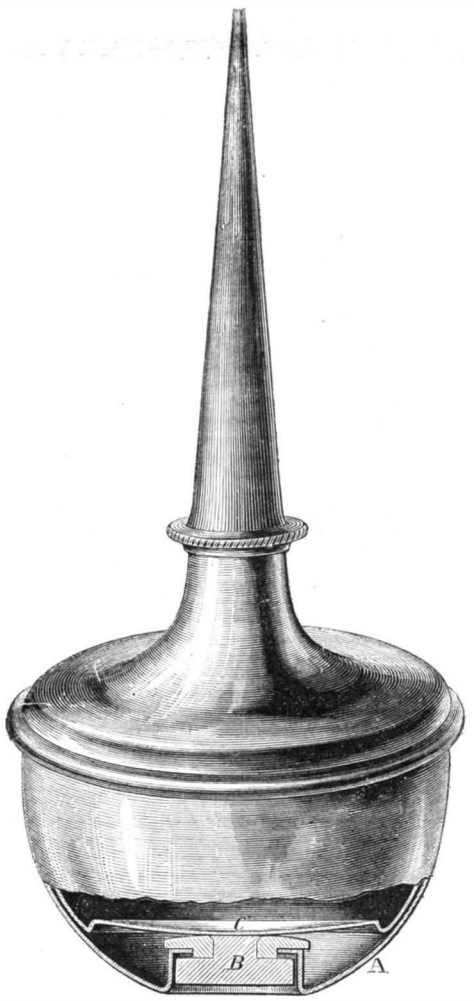
In the line of railway communication between France and Italy there at present exists a break, about forty-eight miles in length, between St. Michel on the French, and Susa on the Italian side of Mont Cenis. Between these towns the entire traffic, both of passengers and merchandise, is now carried on by horse traction, there being a very good road from 30 to 32 feet wide between the two places. The passenger traffic is carried on by diligences, which are bound by contract to perform the journey in nine hours during the summer, and ten and a half during the winter months. The tunnel which is now being made through Mont Cenis is intended, by directly connecting the French and Italian lines, to obviate the necessity for a passage over the mountain; but the difficulties which have to be surmounted before it can be constructed are such that it seems scarcely probably that it can be completed in less than eleven years and a half from the present date. This being the case, it has been proposed by Mr. Fell to carry a line of railway over the mountain, and to form it upon the road already existing. The French Government, when applied to, consented to grant a concession for the construction of that portion of the line which was to be situated within the French dominions, on condition that the practicability of the scheme should be satisfactorily proved; and the Italian Government also promised a concession for the line constructed within their territory, provided that the French should be satisfied with the experiments. In consequence of this, an experimental line has been constructed, 1,960 meters, or about one and one-fourth miles in length, over the most difficult and exposed portion of the road, the site having been chosen by the French Commissioners. It commences at Lanslebourg, at an elevation of 5,322 feet, and terminates near the summit at a hight of 5,815 feet above the sea. The average gradient is therefore about 1 in 13, while the maximum gradient is 1 in 12. On about two-fifths of the length of the line the curves are very sharp, varying from two to five chains' radius; the curve of two chains' radius being necessary to bring the railway round the elbow formed by the junction of the third and fourth "zig-zags" of the present road upon which the line is formed.

The cylinders, of which there are in this engine one pair only, are fixed between the frames under the smoke-box, and are furnished with pistons, the rods of which pass through both back and front cylinder covers. That part of each piston rod which passes through the front cylinder cover is attached in the ordinary way to a crosshead, working between guides fastened to the front cylinder cover and the leading buffer plate. Through the cross head there is a vertical slot, which receives a pin fixed at the end of an arm, which is, in turn, fixed upon one of the rocking shafts already mentioned. The portion of each piston rod which is carried through the back cylinder cover is also attached to a crosshead, but in this instance the guide bar between which the crosshead works are placed on each side of, instead of above and below it. To these crossheads are attached connecting rods, the other ends of which are coupled to cranks placed at the upper ends of the two vertical shafts on which the hind pair of horizontal wheels are fixed. Below these connecting rods, but attached to the same crank pin, are placed coupling rods connecting the cranks just mentioned with others fixed at the upper ends of the vertical axes of the front pair of horizontal wheels. The shafts upon which the hind pair of horizontal wheels are placed, have also fixed upon them pinions gearing into other pinions, turning on pins attached to the underside of a strong stay, carried across the engine between the frames; these two last pinions gear into one another. The horizontal wheels, being driven by the same cylinders as the bearing wheels, are, of course, of the same diameter as the latter, viz., two feet three inches, and they are placed at a distance apart longitudinally of 2 feet 4 inches from center to center. The shafts of the horizontal wheels revolve in bearings carried by sliding frames, of which there are two, one to each of the engines. These frames work between guides fixed to transverse stays between the engine frames, and they are pressed towards the center of the engine by six volute springs bearing on the back of each. The amount of the pressure exerted by these springs is regulated by bars bearing upon them, which bars are capable of adjustment by means of a shaft extending across the engine, and furnished with right and left handed screws. This shaft carries at the end of it a worm wheel, into which gears a worm connected by shafts and bevel gear, with a hand wheel on the foot plate, and the pressure put upon the horizontal wheels can thus be regulated by the driver.

The slide valves are driven by eccentrics fixed upon the leading axle, the eccentric rods being coupled to the lower end of arms or levers working on a shaft, carried across the front of the engine between the cylinder and the large rocking shaft to which the piston rods are connected. The valve spindles are carried through the front end of the steam chest and coupled the upper ends of the arms just mentioned. The boiler is 8 feet 4½ inches long, and 3 feet 2 inches in diameter; it is made with a "flush" fire-box casting, and contains 158 tubes 1½ inches external diameter. The total heating surface of fire box and tubes is 600 square feet, and the fire-grate area is 10 square feet. The boiler is worked at a maximum pressure of 120 pounds. The water is carried in a pair of tanks fixed upon the foot plate, and the engine is furnished with a brake of the ordinary description, acting on the trailing wheels only. The total weight of the engine in working order is about 17 tuns, and its net weight 13 tuns, of which about two tuns 13 cwt. is due to the extra machinery for working the horizontal wheels. The pressure upon the horizontal wheels is, as we have already mentioned, adjustable; during the experiments it amounted to 2½ tuns or ten tuns altogether, but this pressure can be increased if necessary to six tuns on each wheel, making the total pressure 24 tuns. It is found to run very steadily, and to pass round the sharpest curves without any jolting or grinding of the tire flanges, being perfectly guided by the pressure of the horizontal wheels against the center rail.—*Egineeriag.*

BROUGHTON'S OILER.

In cold weather the contents of oil cans congeal so that they cannot be used until thawed out. Of course a stove, if convenient, is the first resort in such an emergency, and the oil cup is immediately placed on it. As a consequence the bottom, which is spun in and soldered, gets leaky, with disagreeable results.



Moreover, as spring bottom oil cups are usually made, the bottom is often "set" or dished by unnecessary pressure, so that in a short time it is useless for its office.

In this invention, as shown by the engraving, these evils are effectually overcome. The first one, by placing the cup within a false bottom, A, as shown in the broken-out part, and the second by inserting a button or cap, B, in the false bottom, so that it bears on the true bottom, as at C, but is prevented from springing it in too much by coming in contact with a shoulder turned on the false bottom. This cap is flush with the said bottom, and does not interfere with it in any way. It will be seen that, by its rotundity, it tends to preserve an upright form, so that the nozzle is always erect when the can is full; when it is empty it makes no difference how the cup stands.

These improvements add to the durability and efficiency of the utensil. Application for a patent is pending through the Scientific American Patent Agency by John Broughton. For further information address Broughton & Oatman, No. 41 Center street, New York.

EXTENSION OF THE PHOTOGRAPHIC ART.

We have in previous numbers of our paper fully described the simple and beautiful process of Mr. Woodbury, of England, by which photographic pictures may be transferred to metallic plates and then printed—much in the same way that copper-plate engravings are produced.

We have lately had the pleasure of receiving, from the editor of the London *Photographic News*, a specimen of this new art of printing, which, in its details of light and shadow, softness and artistic finish, is all that could be desired.

This new process is exceedingly simple, and there is hardly any limit to its application. It is admirably adapted to book illustrations, and for many purposes will supersede wood and plate engrayings. Natural objects can be photographed and then reproduced upon metallic plates for printing with a fidelity and harmony in the gradation of tints which hand work cannot possibly imitate.

We publish an interesting account of the process, from the *News*, in another column.

The Proposed Channel Ferry

The phrase "London to Paris in ten hours" is on which is familiar to most of us, yet, notwithstanding the well known shortness of the time in which a trip between the two capitals can be performed, there are many people who regard the journey with a certain amount of dread, arising in a great measure from the discomforts attending upon the passage across the Channel. We are sure, therefore, that the proposal for forming a Channel ferry, which is now before Parliament, is one which, if properly carried out, will meet with great public favor. It is intended that the steamers forming the ferry shall be one-third longer than those now running between Holyhead and Kingstown; that they shall be roofed over, and the trains—coming, say, from London—shall be run bodily on to their decks, carried across the Channel, and transhipped to the French lines on the other side. The new boats are, under ordinary circumstances, to perform the passage in one hour, during which time the passengers may either remain in the carriages or avail themselves of the waiting and refreshment rooms with which the steamers will be furnished, The Custom House officers can also examine the luggage during the passage; and it is expected that the whole journey from London to Paris can thus be performed in eight hours. Owing to the great size of the steamers, it is expected that little inconvenience will be caused by the short chopping seas of the Channel. It is expected that the ferry may be brought into operation in two years' time.—*Mechanics' Magazine.*

MANUFACTURERS of Leather and Rubber Belting will do well to advertise in the SCIENTIFIC AMERICAN. We have inquiries for such goods from various parts of the country from our readers.

THE Yorkshire Locomotive Works, England, are announced as capable of building 400 locomotives per annum, or over one a day.

© 1866 SCIENTIFIC AMERICAN, INC.

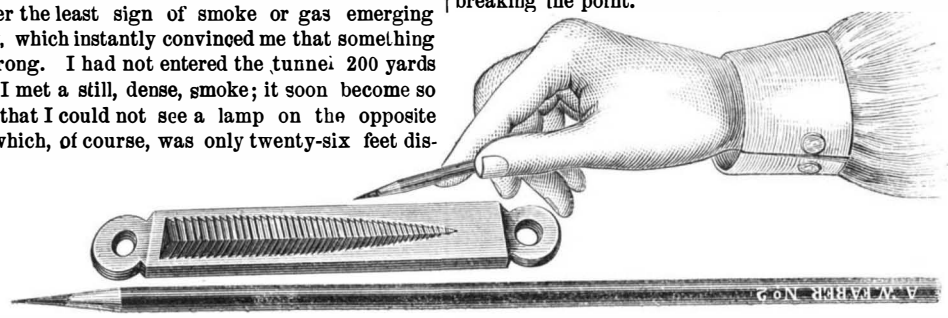
Mont Cenis Tunnel.

In a communication from Pico Mulera, Italy, dated Jan. 4th, Mr. H. Hoskings writes to the London *Journal*: "The mortality among the workmen employed in the Mont Cenis Tunnel is so great, in consequence of powder smoke and bad ventilation, that they have refused to work any more. The work is now at a stand still;" and the statement is especially interesting, from the precise manner in which it confirms the opinion expressed in the *Mining Journal* of Jan. 2, 1864, by our esteemed correspondent Mr. Nicolas Ennor, in the account of his visit to the tunnel. He then stated—"I next turn to the air department. The moment I came to the tunnel I looked to its mouth, and to my suprise I could not discover the least sign of smoke or gas emerging from it, which instantly convinced me that something was wrong. I had not entered the tunnel 200 yards before I met a still, dense, smoke; it soon become so dense that I could not see a lamp on the opposite side, which, of course, was only twenty-six feet distant. The horses and wagons passed but I could not see them. This continued up to within 100 yards of the end, where a light could be seen for twenty yards. Here air was liberated sufficiently to support the men with the machine, but as it passed back, where the sidemen were at work, it was all devoured by the men and lamps. I took the mallet to strike the man's borer, to say I had helped to drive the tunnel, but I could not see the head of it; so I threw down the mallet and took a pick and worked out a little. I now leave it for practical men to say what they think of working in such a place as this, and they are now in only three-quarters of a mile, and have nearly three miles more to drive. I was in about an hour, and when I came out I spit as black as though I had dined on lampblack—so did the gentlemen who accompanied me. I think I have had over 55 years' actual mine practice, and I have come to the conclusion that this work will never be accomplished without other means than the present be adopted. I am satisfied that there is nothing deserving or eulogizing to the French or Italian engineering for what is doing to carry out this undertaking, notwithstanding that they have an abundance of water-power at command, and machinery that, I should judge from a momentary glance, cost £40,000. I will not, however, stop here to describe the machinery already erected." Mr. Ennor contended that there was not a quarter air enough, and a man without that would decline and die; but beyond this he proposed a remedy. He said that there is water-power sufficient in the valley to drive in a 3-foot tube full of compressed air; this would drive out all the smoke and contaminated air, or, if exhausted, by this tube bringing out the foul air, and let the fresh supply go in through the tunnel. The same machinery could be tried each way, to prove which is the most effective. The work could not go on well till there was an effective circulating current in and out. He next suggested as a second means to bring a large tube down from the mountain top, and carry it into the tunnel end. This would produce a rapid current, or, if this be found sufficient, put a furnace to it, as used in coal mines. Air in that situation can be carried, he said, to an unlimited extent. The first thing to be looked after is to have a circulating current of air—this attained, the tunnel would go through, but not otherwise.

A Terrible disease is raging in some parts of Germany. An insect called *trichina* infests pork, and eaters of this flesh uncooked, or only partially cooked, take it into the system, where it speedily causes death. The sufferings of the patients are most horrible. But one case is known to have occurred in this country—that of a young lady at Detroit—but several instances where parties have been supposed poisoned by eating ham were from this insect. Avoid raw or half-raw pork, such as Bologna sausage.

SHAVER'S PATENT PENCIL SHARPENER.

The accompanying engraving represents a convenient, durable, and desirable pencil pointer, just introduced into the market. It is made from the best cast steel, hardened, tempered, and finely polished. The file groove is finely cut at its small end for pointing lead pencils after the wood has been cut away, or more particularly adapted to pointing the leads of any of the well-known extension or propelling pencils, which do not require the cutting away of the wood, but can be easily adjusted and brought up to any kind of a point to suit the user. The wide end of the groove is coarser cut, which is intended for sharpening slate pencils, which it does quickly and without breaking the point.



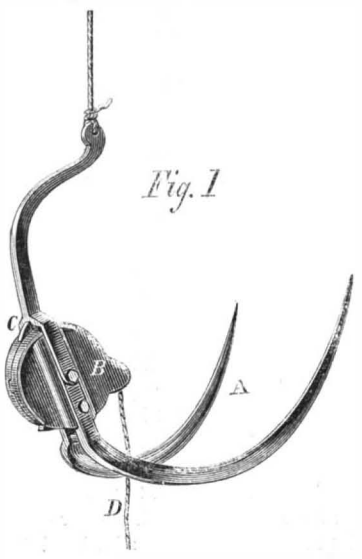
This pencil sharpener is adapted for the counting-room, artist's studio, and is especially useful in the school room, as it will relieve the teacher from that oft-repeated request, "Please sharpen my pencil."

We are informed that this article is already in the hands of the largest wholesale and jobbing stationers of New York and other large cities, and, no doubt, will soon find its way into banks, insurance, and other offices, academies, and schools throughout the United States. They are sold at 25 cents each; a liberal discount to the trade.

This invention is covered by patents in this country and in England and France. For further particulars address the inventor, A. G. Shaver, New Haven, Conn.

REYNOLDS'S HAY FORK.

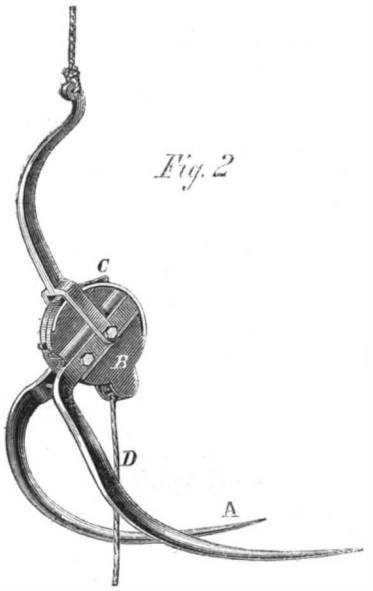
This fork is one that has lately been introduced at the West, where it is said to have proved satisfactory in its operation and otherwise become popular. In



construction it is quite simple, having two tines, A, connected to a circular shank, B, which contains the tripping apparatus to discharge the load. This is simply a latch, C, so arranged that, by pulling a line, D, the latch is released and the load discharged—the parts reconnecting themselves again in the act of reloading the fork.

This implement is made of iron and has only two tines, but these are found quite as efficient as any greater number. The fork can be used for stacking as well as for loading, and the inventor sends directions to do this work in his circulars. The weight of the fork is twenty-five pounds, and it is sold very low. Many certificates of its utility have been shown us, but we cannot publish them here. The proprietor wishes to sell rights.

It was patented through the Scientific American Patent Agency on October 18, 1864. For further information address the patentee, E. Reynolds, Hartwellville, Mich.



Extraordinary Discoveries of Oil.

The Pithole region, where oil has been found in large quantities, has lately been the scene of extraordinary excitement. The *Record*, published at that place, says:—

The whole ground seems saturated with oil. One man dug a hole in the ground about a foot deep, and in a few minutes got a pailful of oil for his trouble. The ground is now being riddled with shallow holes in which large quantities of oil ooze up, and the scene forcibly reminds us of gold digging.

At one of the springs belonging to the Buffalo House the proprietor had gathered four barrels of oil with a tin dipper, and there are many others who have been equally fortunate.

Oil was found in a great many cellars yesterday. Mr. Bernand Morahan filled a large washtub with oil from his water pipe; a number of others have done the same.

A well belonging to the Confer Hotel (late Hubbs's House) has been found to have oil on it; another oil spring has been found in the rear of Fifth street, so that we may presume that every man will be able to dig his own oil before long.

Many ludicrous incidents are narrated of the manner in which some of them took their sudden accession of fortune.

Yesterday morning, men, women and boys could be seen with tin pails, wooden pails, teakettles, etc., in their hands, vainly searching for pure water. Oil might buy coffee and tea, but not make it, so that urchins who had to be water-carriers appeared to think there might be too much of a good thing, even if it is oil! Nor are they alone in their grief, for a cow walked up to her accustomed watering place smelt the oil, and evidently thought petroleum would make butter taste bad.

At the first discovery of the wells the excitement began to increase, and a man who has heard of the various fractions used in the oil trade, offered to pump all day for one-thirty-seventh of the oil; others were more selfish, for they would pump all the time but wanted half the oil, and were willing to take the washerwoman into the bargain.

An Irishman, who had a small spring, was highly elated at the turn fortune was taking. Said he, "Yesterday, I wasn't worth a cint, and, be jabers, to-day I'm worth thousands upon thousands."

Gas Purification.—Experimemts are being now made at the Crystal Palace District, and other gas-works, to test the practical value of a recent discovery by Dr. Letheby, who, besides his many other engagements, is now consulting engineer to several gas companies. He had found that the waste material of the soda manufacture, and known as "soda waste," is unexpectedly effective in absorbing the sulphur compounds in crude coal gas, and especially the obstinate bisulphide of carbon. The soda waste is employed in the purifiers in layers, as much as oxide of iron is now generally employed to arrest the sulphureted hydrogen,

© 1866 SCIENTIFIC AMERICAN, INC.

Correspondence

The Patent Beer Question.

MESSRS. EDITORS:—The daily and weekly press have of late been much exercised debating opinions relative to patent beer and claims to public favor. It will suffice to say, that some time ago, a number of leading New York lager-beer brewers obtained licenses to brew under the Hammer patent, and as soon as they brought their new beer in competition with the old they encountered all the reverses incident to the introduction of every new invention. Professional jealousy and a stereotyped prejudice against reform helped wonderfully to debar the road of progress, and compelled the licensees to issue their card and the chemical record.

It is not intended to advert to the various views indulged in, but I propose to expose the more important part of the chemical testimony, *i. e.*, the comparative analyses.

We see by the same, that in comparing the old and new method of brewing an immense amount of extract and starch-sugar is wasted by one and saved by the other, while converting malt into wort, the acknowledged base of either beer or spirit.

The figures of the published analytical report demonstrate that wort made in the usual way contains in one gallon of 282 cubic inches and ounces avoirdupois at 60° Fah.:—

Dry malt extract 19·807 ounces, starch sugar 6·005 ounces, while the new, or Hammer wort, at the same temperature, shows the excess of dry malt extract 32·219 ounces, starch-sugar 11·620.

It is not the object of this communication to enlarge upon the pecuniary proceeds resulting from the working of this improvement, but to call attention to another fact passed over altogether by your cotemporaries. Brewing and distilling are two very nearly related vocations; both branches of industry employing nearly the same material under the same circumstances, although different products are rendered, but both trades consume a quantity of grains, which amount to, if correctly reported, a stupendous figure.

Both professions commence their respective operations by mashing the grain preparatory to converting the starch contained in the malted or raw grain into sugar, to be further transformed by fermentation into alcohol and carbonic acid, and here their common path separates. The brewer has now essentially done his work, but not so the distiller. He now sets to work to separate or distil the alcohol from its connection with the wort by converting the former into vapor, and condensing this vapor, which produces what is called alcohol or spirit. When we left the brewer's wort, it contained all the components of beer, requiring but the separation and settling of the yeast, or, in other words, to become clear, in order to be ready for market. It will now be pertinent to examine two brewer's worts prepared under the methods at issue. The old school wort containing (as per analyses) less starch-sugar and a marked surplus of dextrine, which latter ingredient must be looked upon as detracting from the quality and keeping tendency of the beer; the new school wort, on the other hand, showing a very large excess of starch-sugar, the base of alcohol and carbonic acid, with an entire absence of dextrine—and must, under such circumstances, possess a large proportion of the main features of champagne (alcohol and carbonic acid), which impart to the liquid not only that pleasant taste and flavor, but also insure its keeping quality. The distiller's wort, however, prepared after the old recipe, has other disadvantages, for the absence of so large an amount of starch-sugar, imperatively required for the formation of alcohol, necessarily reduces the yield of alcohol; and the presence of so much dextrine, which this imperfect mode of mashing is not qualified to convert into starch-sugar, only serves to enrich the swill or residue. The defects of the old school mashing are thus clearly shown, and sum up as follows:—The old-school distiller, failing to convert all the starch entirely into sugar, loses, consequently, in the quantity of his alcohol, and also, what he retains as dextrine in his swill; but the old-fashioned brewer fares worse still; he is likewise unable to transform all the starch into sugar, and naturally the dextrine remaining thus unconverted, is not connected with the swill, as in the case of the distiller, but is held inseparable in the beer, the result of his labor, where it forms the radicle for the disintegration of the liquid, it impairs the quality and predisposes acidity of the beer, and, as a matter of course, he is a loser both in quality and quantity.

Now, as the purposes of the brewer and distiller are, as far as mashing is concerned, so nearly related, it is but proper to suppose that a certain saving in one branch must be economy for the other; and if, therefore, a given quantity of barley or corn is saved in brewing, the same quantity of superior beer is produced, why cannot the same rule apply to the producer of whisky or alcohol when the object of economizing an enormous amount of grain, useful for other purposes, is at issue?

The patented process also shows the remarkable facility with which starch-sugar is developed, and thereby that much-sought-for base, for alcohol and carbonic acid, gained, but at a reduced expense; and the obvious fact of a perfect exhaustion of the fundamental grain, added to the list of advantages, must still further lessen the cost of production, and infallibly show that whisky, beer, or alcohol can henceforth be furnished at figures widely in contrast with present rates, and causes, at the same time, a simultaneous saving of grains, reserved to be absorbed by the various channels of the market.

It may be safe to state that 100 lbs. of barley will yield about 60 lbs., and 100 lbs. of corn about 70 lbs. of starch, from which the common plan of brewing and distilling does extract but two-thirds, leaving the balance to become a deleterious component of beer in the form of dextrine, or, as in the case of distilling, the remaining one-third forms part and parcel to increase the bulk of the swill. Aside from the benefits of the process, I will now illustrate by figures an approximate estimate of the saving of malt. Take, for instance, a brewery producing per annum 10,000 barrels; here are used under the old rule 2½ bushels of malt and over, for every barrel of lager beer, making a total of 25,000 bushels for the year's supply; the new process, for the same number of barrels, requires about 1¾ bushels of malt per barrel, but let it even be two bushels, consuming in this way 20,000 bushels in all, showing a difference of nearly 5,000 bushels in favor of the agitated reform.

In order not to overtax the reader's patience, it must be stated, in conclusion, that in 1863 there were in the loyal States about 1,800 breweries, all of which produced then no less than seven millions barrels of ale and lager beer, unconscious, perhaps, that they lost at the same time 5,250,000 bushels of malt; and that same figure will, beyond a reasonable doubt, also represent the loss, from the like cause, on the part of our old school distillers. PROGRESS.

Brooklyn, N Y., Feb. 7, 1866.

Of a Large and a Small Pulley.

MESSRS. EDITORS:—In your usually correct journal of the 16th of January, I observed the following question. "Has a large pulley any more purchase than a small one aside from friction?" Your answer was—"A large pulley has more power than a small one in proportion to the difference in diameter." I need not tell you, after you take a second thought, that there is no difference in the power of a large and a small pulley except the additional friction. I should have written you before, had I not waited to have you or some other person correct it. It being such a popular fallacy that I did not like to have it pass without correction, particularly in a journal we Americans are so justly proud of. C. H.

New Haven, Conn., Feb. 10, 1866.

[A pulley has no power at all, strictly speaking, but it is easier to drive a machine with a large pulley than with a small one. It is easier for a horse to draw a carriage with large wheels than with small ones. A wheel is a continuous lever and the longer the arms of the lever, the easier the work is done. —EDS.

Gears for Screw Cutting.

MESSRS. EDITORS:—Having seen in your valuable paper of Feb. 3d, D. Booth's rule for finding the gear for cutting screws, I would ask him how he would find the ratio in case the ratio of increase is not regular. For instance, commencing with 20, 25, 30, 36, 40, 44, 45, 48, 52, 56, 60, 64, 70. There are not many lathes on which the gear increases by any particular ratio. I would like to have Mr. Booth give an explanation. S. V. EASTMAN, Machinist.

Waterloo, C. E, Feb. 4, 1866.

[Rules for cutting screws of any pitch by gears can be found on page 295, Vol. XI.—EDS.

Cold Iron Floating on Molten.

MESSRS. EDITORS:—If into a ladle of molten cast iron a piece of cold cast iron is dropped, the piece of cold iron will float, although its specific gravity is the greatest, as is evident from this, that in cooling iron always shrinks. Please tell us why this heavier cold iron floats in the lighter melted iron.

A SUBSCRIBER.

Watertown, N. Y., Jan. 30, 1866.

[This matter was discussed a good deal in Vol. XII, but no explanation that was offered was entirely satisfactory. Indeed, we have never seen an account of observations of the phenomena that were thorough. Will our correspondent try the experiment of pushing the cold iron under the surface of the molten, and seeing if it will return to the surface?—EDS.

NEW INVENTIONS.

Paper Socks.—The nature of this invention consists in producing a new article of manufacture, viz: socks made of paper, or paper and muslin combined. It is well known that paper is one of the best materials for keeping in or causing the body to retain its natural heat; in other words, it prevents cold air from reaching such parts of the body as may be enveloped in it. The inventor designs his paper socks particularly for use under or over an ordinary pair of socks or stockings, to be worn in cold weather; but it is obvious that they can be made of a kind of paper which will last as long as an ordinary pair would keep clean, and they can be made so cheaply that their cost will not equal the price of washing. These socks are intended to bear the same relation to knitted or woven socks or stockings that paper collars do to linen or muslin collars. J. W. B. Covington, of 37 Park Row, New York City, is the inventor.

Sugar Cleaning Machine.—This improvement relates to that class of machines in which the sugar is cleaned by centrifugal action. The moistened sugar is thrown into a tub which has its sides perforated with fine apertures. Rapid motion being given to the tub, the moisture and dirt are expelled by centrifugal action, and the dry, clean sugar remains in the tub. The present improvement consists in driving the sugar tub from below, thus giving free access thereto. Prior to this invention, the driving shaft passed up through the tub, and cumbersome framework, gearing, etc., was required around and above the machine, which greatly interfered with convenient operation. These improved machines are now in general use. Hartson & Woolsey, New York City, are the patentees.

Water Wheel.—This invention relates to a new and useful improvement in water wheels of that class which are placed on a vertical shaft, and inclosed within a scroll, commonly termed turbine wheels. The object of the invention is to obtain a simple means for varying the capacity of the wheel according to the power required from it or to the supply of water, so that the wheel may operate and give out any amount of power less than its maximum without consuming any more than a proportionate amount of water. It is well known to millwrights that a turbine water wheel, when running under a diminished supply of water, and consequently giving out less than its maximum power, consumes or draws a proportionately greater amount of water than when giving out its full or maximum power. Hence, there is a great loss of water in running a wheel of this class under a variable head or under a diminished supply of water—a difficulty which is fully obviated by this improvement. John Tyler, of West Lebanon, N. H., is the inventor.

Watch.—This invention relates to a watch which shows on its face or dial, besides the hour, minutes, and seconds, also the day of the month, or the date, which appears through a small aperature in the dial, being marked on a disk, which revolves under the dial, and to which an intermittent motion is imparted

© 1866 SCIENTIFIC AMERICAN, INC.

once in twenty-four hours, so that the date changes automatically at the proper time, and a watch is obtained which, with a trifling additional expense, will prove to be of great convenience for business men, clerks, and, in fact, for the public in general. E. Oppenheimer, of 8 Maiden Lane, New York City, is the inventor.

Steam Valve.—This invention relates to a plug valve, which is provided with a steam passage, extending transversely through the plug and bell-shaped at its end, leading to the induction port, in combination with a shell, having three apertures, one of which serves to admit steam to the shell, while the other leads to the exhaust pipe, and the third to the cylinder, in such a manner that the induction port in the aperture leading from the shell to the cylinder is always open, and by turning the plug it is alternately made to communicate with the steam supply pipes, and these with the exhaust pipe, and consequently a rotary motion imparted to said plug valve changes the steam instantaneously. Wm. H. Akins, of Dryden, N. Y., is the inventor.

Well-Boring Instrument.—The object of this invention is to produce an instrument by means of which a well may be bored and reamed rapidly, cheaply, and efficiently, without the use of sand pumps or reciprocating drill. A borer, having something of the character of a brace and bit-iron reamer, is provided with three or more curved cutting faces placed at equal distances around its point, and is connected with the base of a hollow cylinder by a socket joint. Its curved cutting faces take a spiral form, and are continued up to the top of the cylinder, thereby forming parallel spiral grooves on the outside thereof. The burr cutters reduce the rock below it and along its sides, while the edges of the spiral grooves act as reamers, the grooves themselves performing the office of elevators, and raising the silt or reduced rock nearly to the top of the cylinder, where the grooves are intersected by openings which admit the silt and reduced rock to the inside of the cylinder, from which they are discharged, when it is full, by raising the instrument from the well and removing the borer. The hollow cylinder may be made long enough to hold all the silt that will accummulate while the burr is being worn dull in boring ordinary rock. The burr and cylinder should be made of a combination of Franklinite or crystalized iron, so called, for the purpose of obtaining a hard and tenacious substance. A water pipe runs centrally through the hollow cylinder and through the burr, branching, however, before reaching its oint, so that a branch issues in each of the sunken aces that occurs between the cutting edges of the urr and as near its point as the strength required bo be given to that part will admit of. A column of water is allowed to descend this tube (the tube being connected with a hollow drill rod) and issue at the end of the burr, so as to clear it of accumulations of reduced rock. The pressure of the water will cause it to ascend around the cylinder and thence to the top of the well, the heavier portion being received into the interior of the cylinder through its lateral openings, and the residue being carried with the current of water to the surface of the ground. Samuel H. Whittlesey, of Appleton, Wis., is the inventor.

Buckle or Belt Clasp.—This invention, by I. N. Plotts, of New York City, consists in certain improvements in buckles or belt clasps, which improvements are particularly applicable to a buckle or belt clasp, for which letters patent were granted to said Plotts on the 7th of November, 1865, in which patent the buckle was shown as being constructed of a rectangular or other shaped frame, and slightly curved or bent transversely, having one or more cross bars, provided with lips on their outer edges to insure a better hold upon the straps, the object being to avoid the use of the tongues or teeth employed in ordinary buckles, which perforate the strap or band and soon weaken it so that it is liable to break, or at least so injure it as to render it useless. The invention, which is the subject of the present patent (the claims may be found in the list published this week) consists in the manner of setting the bars of the buckle so as to produce a sharp bight or bend of the straps; and in attaching lips to the inner edges of the under side of the buckle; and also in milling or serrating the lips as well as the raised or depressed edges of the bars or frame of the buckle—by which improvements the inventor claims that the possibility of the strap slipping is entirely precluded, and this effected without in the least impairing the qualities of the buckle for permitting the strap or band to be quickly and easily tightened up or loosened or released from the buckle. We are informed that Messrs. Wests, Bradley & Cary have adopted the buckle for use on the bands of their Duplex hoop skirts. These buckles are very simple in their construction, and can be manufactured and sold very cheaply. Mr. Plotts may be addressed at 240 Broadway, Room 19, or 97 Chambers street, New York City.

Tubing Oil and other Wells.—This invention consists in surrounding the well tube of an oil or other deep well, through which oil or other liquid is usually raised from the bottom of the well, with an outer, supplementary tube extending downward from above the surface of the earth to a point below the place for applying the usual water packing, and applying such packing around the said outer tube, instead of the well or pump tube. James D. Bryson, Petroleum Center, Pa., is the inventor.

Machine for Treating Peat.—The object of this invention is the preparation of peat for fuel in a condensed state, with or without coal dust or other fine concentrated combustible matter, so that it can be handled with convenience and transported with ease and economy, to be used at a distance from the place where it is dug. It consists in a combination and arrangement of devices, by means of which the peat is reduced to a suitable condition and form for being handled and dried, the crude peat being elevated by mechanical means to the top of the machine and delivered to the action of knives or arms which revolve between fixed knives or arms so as to break it up. This action on the peat is had beneath a hopper, from which is delivered continuously a supply of fine coal dust or other fine concentrated combustible material. It is next passed between smooth cylinders of unequal diameters, or between cylinders which are revolved at unequal velocities, whose action is to destroy the natural organization of the peat and to destroy the tubular character of the undecomposed fibres which are interlaced through it, rubbing and grinding the mass so as to reduce it to a very fine plastic state. From thence the peat descends or is carried against molders, which consist of rollers, upon whose peripheries are formed triangular depressions, which are arranged on one roller conversely to their arrangement on the other, so that when the depressions meet or articulate in the revolution of the rollers, a cavity is formed whose sides are parallel. The peat mass presses by gravity against the faces of the rolls and fills the depressions as fast as they are presented, and is afterward delivered upon the other side of the rollers, on a travelling belt or platform, which carries it to the drying ground or to workmen who remove it to the place where it is to dried. Thomas J. Wells, of 35 Pine street, New York City, is the inventor.

Coloring Meerschaum Pipes.—The object of this invention is to give to smoking pipes, known as meerschaums, the peculiar color which has hitherto been slowly and imperfectly imparted to them only during a long time of constant use in smoking tobacco in them; and it consists in covering the bowl of the pipe with a close fitting cover, penetrated by a tube through which, when the pipe is used, tobacco smoke may pass and enter the pipe on its way to the mouth of the person who is engaged in smoking. The tobacco to be smoked is contained in any ordinary receptacle or bowl placed at the outer end of, or otherwise connected with, the tube, or it may be fixed on the tube itself, according to the mode of using tobacco cartridges, shown in the patent granted to the inventor November 1, 1864. The treatment herein set forth may be applied to other pipes besides meerschaums. Holman J. Hale, of 16 Beekman street, New York City, is the inventor and manufacturer of this unique improvement.

Compression Gage Cock.—One of the objects of this invention is to arrange and construct a gage cock in such a manner that while it is simple, both in construction and operation, its valve may be reground to its seat when it becomes leaky without disturbing the joint connecting it with the boiler, and without the use of tools of any kind or description. Another object is to construct a compression gage cock in such a manner that while its valve is free to move in a longitudinal direction, so that it may at any time be withdrawn, and while it is also free to rotate on its axis, so that it can be reground, yet the said valve will not rotate on its seat in the act of closing. Another object is to construct a compression gage cock provided with a metal valve and valve stem, in such a manner as to dispense with the use of a stuffing box or gland to pack the said stem, at its outer end, and admit of the cock being operated under high pressure without the possibility of scalding the hand of the operator. John Broughton, of 41 Centre street, New York, is the inventor.

American Pirate Beehive.—Important improvements are claimed in this hive, based on the recent discovery, that cera alba is elaborated into hexagonal cells by a law inherent in the substance itself, and not by the mechanical or artistic skill of the bee. The improvements consist in combining walls with air-chambers in such a way as constantly to secure that mediocrity of the temperature necessary to the formation of an amount of comb equal to the working capacity of the swarm. Such is the form of the hive that seams and windows for ventilation are excluded. The top and sides of said hive are, at the will of the operator, rendered air-tight. In the brood chamber, a number of comb guides are so arranged as to secure uniformity and rapidity of growth. The inside improvements consist in making brood chamber and honey box of slats of convenient size, and surrounding said slats with varnished paper, which may be separated at pleasure. To protect the bees against the ravages of the moth, an apparatus, made of tin, and resting on the bottom board, is closely fitted to the inner surface of the hive. This apparatus somewhat resembles the letter U inverted, the interior shank of which is so shortened as to place it out of the reach of worms on the bottom board, while a slight coat of soft grease, on its inner surface, prevents their reaching it by that route. Messrs. Lemuel and Minor Taylor, and Edwin Cox, of Jordan, Wis., are the inventors.

THE NAVAL RACE.

The last scene of all in this vexed question took place on the 13th and 14th inst., culminating in the race previously alluded to in this journal as about to occur. We were not on board either of the vessels but take our account from the daily papers.

The *Winooski* beat the *Algonquin* 70 miles in in 390—a very bad beat. The *Winooski* is a naval vessel, with an ordinary inclined engine; the *Algonquin* is also a naval vessel, with an engine designed by Mr. E. N. Dickerson. The point of dispute was the ability of the *Algonquin* to run further and faster than the *Winooski*, and to tow her back over her course after the latter's coal gave out. This programme was slightly changed in the actual performance, as the *Algonquin* was behind, and not the *Winooski*.

It is impossible to tell the actual performance of the engines from the daily press reporters' accounts, as they print anything told them—as for instance this ludicrous statement:—"About an hour after starting, the main feed pipe, which conveys the condensed water to the boilers, got out of gear, and soon after ceased working altogether; thus obliging the use of the auxiliary engine to supply the boilers with salt water, which was, of course, highly detrimental to the workings of the engine, inasmuch as salt water clods or chokes the flues."

Clods the flues!

The *Algonquin* carries high steam, 65 pounds, and cuts off short. The *Winooski* carries low pressure, and cuts off at $\frac{7}{10}$ths of the stroke in "Engineering Precedents," but at less than half-stroke in practice. The average revolutions in the race of the *Winooski* were $21\frac{1}{2}$; of the *Algonquin* 18. Although the latter vessel was beaten, it is contended that her engines comply with the terms of the contract, and are therefore to be accepted by Government.

A LOCOMOTIVE passed over the Hudson River Bridge at Albany, for the first time, on Thursday, the 15th inst.

MORE than 1,000 farm engines are built annually in England.

© 1866 SCIENTIFIC AMERICAN, INC.

Improved Paddle Wheel.

The novelty of this wheel consists in so feathering the buckets that they will, during their entire revolution, radiate from a point at the summit thereof. The mechanical construction is extremely simple and embodies great strength and durability. The principle upon which the wheel is designed may be briefly stated as follows, reference being had to the diagram, Fig. 4:—

If two circles, *x*—*y*, of unequal diameter, be drawn eccentric to each other, but tangent at a point, *o*, and each circle be divided into the same number of unequal parts, 1, 2, 3 and 1*a*, 2*a*, 3*a*, etc. (numbering from the common point, *o*), and lines 1—*o*, 2—*o*, 3—*o*, etc., be drawn from the points of division of the larger circle, *x*, to the common point, *o*, these lines pass through the corresponding points of division of the smaller circle, *y*. Now, if the circles are supposed to revolve each upon its own center and with equal angular velocity, the point of tangency, *o*, will remain fixed, and the relative position of the points of division of both circles, *x* and *y*, with reference to each other and the common point, *o*, will not, at any time, be changed; a line drawn through a point of division of one circle, and the common point, *o*, will always pass through the corresponding point of division of the other circle.

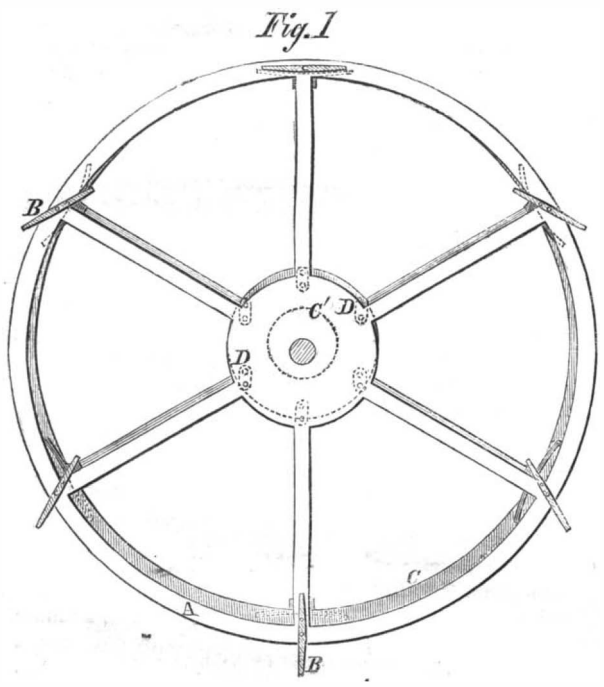
To apply this principle to the construction of a paddle wheel, the rims of the side frames which support the buckets are made to perform the functions of the circle, *x*, the points of division becoming the bearings in which the buckets are supported by central axial journals; and the rim of an auxiliary or "feathering" side frame is made to perform the functions of the circle, *y*, the points of division becoming studs which enter grooves formed in the ends of the buckets, parallel to the plane of their surfaces, so that each bucket is supported at two points in the plane of its surface. These two points, as has been shown, bear such relation to each other and the summit of the wheel, that a line or plane passing through both, must pass through the summit of the wheel. It follows that each bucket must, during the entire revolution of the wheel, radiate from a fixed point at the summit thereof.

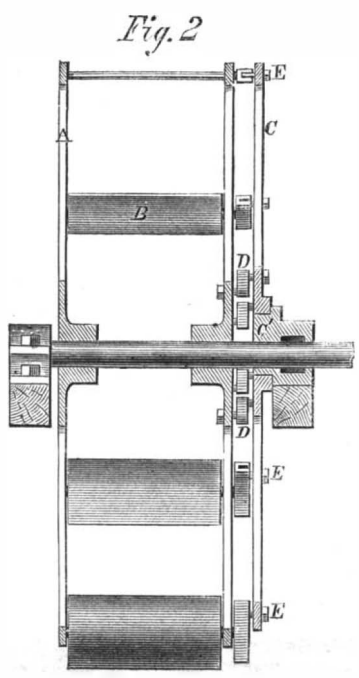
Fig. 1 shows a sectional elevation of the wheel, and Fig. 2 a cross sectional elevation of the same; Fig. 3 is a perspective view of one of the buckets, showing clearly its grooved end. A A represent the wheel rims or side frames proper, in which the buckets, B, are supported by their axial bearings, *b*. C represents the feathering side frame revolving on an eccentric trunnion, C', and driven from the adjacent wheel frame by the connecting links, D, so that both frames revolve with equal angular velocity.

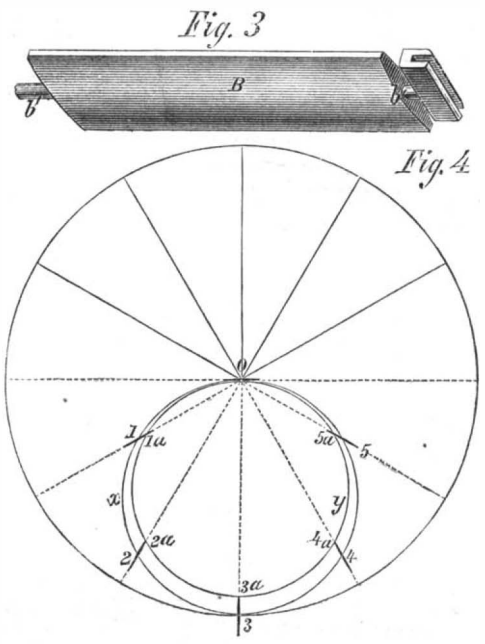
This wheel, the patentee says, possesses great advantages over some of the central radial and feathering float wheels now in use; also over the screw propeller. As compared with a central radial wheel of equal size and dip, it avoids entirely the loss of power from plunge and lift on the entrance and exit of the buckets from the water. The angle of the buckets of this wheel and its efficiency are the same as would be obtained by a common central radial wheel of double its diameter—that is, a wheel on this plan, of say six or twelve feet diameter, has the same propelling angles, respectively, as a common central radial wheel of twelve or twenty-four feet diameter. This is at once made evident by an inspection of Fig. 4. As compared with the screw propeller it possesses the advantages of direct over oblique action of its buckets to the water. This ability to work effectively under any degree of immersion, makes this wheel, the inventor states, specially adapted to sea-going steamers, the paddles of which, from various causes, are subject to great variations of dip. It is also especially adapted to war steamers, as by full immersion it is entirely protected from injury from the enemy's shot, and is claimed to be specially adapted to propelling canal boats. For this purpose it may be made of small diameter so as to occupy little room, and will fully meet the requirements of shallow water and the necessarily great variations of immersion.

The inventor, having business connections with a ship and boat building business and a machine shop, is prepared to contract for wheels of any dimensions or steam canal boats or steamboats of any size, with machinery complete.

This wheel is the invention of Edgar Haight, and was patented through the Scientific American Patent Agency, on Nov. 7, 1865; further information may be obtained by addressing him at his residence, Buffalo, N. Y.







HAIGHT'S RADIATING PADDLE WHEEL.

OUR SHIP YARDS.

The shipbuilders are active now, and a walk through the yards will reveal many frames going up and keels being laid, where but a few weeks ago there was nothing but chips.

At the present time more steam vessels and fewer sailing vessels are being constructed than ever before. All the coasting trade is being done by screw steamers and a few side-wheel vessels, ranging from 800 to 1,500 tuns, and the few sailing vessels building are small craft of no great burden.

The Pacific Mail Steamship Company have an immense fleet of magnificent ships. None finer or swifter are to be found on the globe, but they purpose adding to these several others, two, at least, to trade between California, Japan, and China.

These vessels are essentially the same as the *Constitution* and *Golden City*, now in service. They are building by William H. Webb, Esq., and Henry Steers.

They are to be 360 feet long and 50 feet beam, and are to be built of the best materials. The engines are building by the Novelty Iron Works, and are of the same patterns as the other ships named, viz: cylinder 105 inches diameter and 12 feet stroke.

At Mr. Simonson's yard, near the Novelty Works, we found several new ships for the Norfolk and Richmond line under way. These ships are to be side-wheel vessels, 260 feet long and 40 feet wide. One of the ships is to have a feathering wheel on Manly's patent.

The Sound boats for the Merchants' Steamboat Co., of Bristol, R. I., are building here, and are to be magnificent in design and proportions. They are 374 feet long and 50 feet beam, with heavy timbers and frames.

Several other ship yards are doing a good business.

Since the close of the war the ram *Dunderberg*, not being needed, has laid alongside the dock, receiving her machinery. The lower hold presents a deep and darksome sight, and all is at present chaos. The parts generally—cylinders, condensers, guides, shafts, etc.—are in place, but the details, which always consume the most time, are far from perfect.

NEW SAFETY APPARATUS FOR LOWERING SHIPS' BOATS.

On Friday, February 2d, a large number of gentlemen connected with the merchant marine of this city, and also others representing foreign interests, witnessed a trial of a new apparatus for lowering boats from ships while under way.

The experiment was conducted on board the revenue cutter *Cuyahoga*, and was a complete success. At a given signal, a boat manned by a full crew was launched from the davits, and under way in a few seconds. The ship's way gives an impetus to the boat, and by putting the rudder over, it is steered off from the vessel, and is free to go in any direction. It is asserted that this apparatus can be used in all weathers, and is specially valuable in a heavy sea when the ship lurches, as the boat can be detached instantly instead of being unhooked prematurely or lifted at one end, as is sometimes the case. Many deaths have been caused from the defective block and fall arrangement commonly used.

Foreign patents are being taken out on the invention through the Scientific American Patent Agency. In a few weeks we shall be able to present our readers with an engraving of it.

How to Circulate a Newspaper.

Another new scientific newspaper has been issued in London, called *Engineering*. It is edited by Zerah Colburn, and is devoted to mechanical and scientific matters in general.

As an illustration of the way English manufacturers go into business, the publishers of the journal announce that sixty-five thousand copies have been printed of the first number, and that of these, *sixty thousand* have been taken by one firm alone. Mr. Colburn's paper promises to be an interesting and valuable record.

© 1866 SCIENTIFIC AMERICAN, INC.

THE

Scientific American.

MUNN & COMPANY, Editors & Proprietors.

PUBLISHED WEEKLY AT

NO. 37 PARK ROW (PARK BUILDING), NEW YORK.

O. D. MUNN, S. H. WALES, A. E. BEACH.

☞ Messrs. Sampson Low, Son & Co., Booksellers, 47 Ludgate Hill, London, England, are the Agents to receive European subscriptions for advertisements for the SCIENTIFIC AMERICAN. Orders sent on them will be promptly attended to.

☞ Messrs. Trübner & Co., 60 Paternoster Row, London, are also Agents for the SCIENTIFIC AMERICAN.

☞ "The American News Company," Agents, 121 Nassau street, New York.

VOL. XIV., No. 9..[NEW SERIES.].. *Twenty-first Year.*

NEW YORK, SATURDAY, FEBRUARY 24, 1866.

Contents:

(Illustrations are indicated by an asterisk.)

*Evans, Collins & Smedley's Tile Machine	127	Of a Large and a Small Pulley	132
New Photographic Process for Printing	127	Gears for Screw Cutting	132
Record of Boiler Explosions.	128	Cold Iron Floating on Molten	132
Miscellaneous Summary	128	New Inventions	132
Liebig on Coffee	129	The Navy Race	133
Patent Office Decisions	129	*Haight's Radiating Paddle Wheel	134
Special Notices	129	Our Ship Yards	134
An Oil Well on Fire	129	New Safety Apparatus for Lowering Ships' Boats	134
Locomotive for the Mont Cenis Tunnel	130	How to Circulate a Newspaper	134
*Broughton's Oiler	130	Another Huge Locomotive	135
Extension of the Photographic Art	130	Second-Hand Machinery	135
The Proposed Channel Ferry	130	The Broadway Subterranean Railway	135
Mont Cenis Tunnel	131	Patent Claims....136, 137, 138,	139
*Shaver's Patent Pencil Sharpener	131	Notes and Queries	139
*Reynolds's Hay Fork	131	*Butterworth's Corn Harvester	142
Extraordinary Discoveries of Oil	131	* Hubbell's Gearing for Thrashing Machines	142
The Patent Beer Question	132	Bessemer Steel Rails	112

ANOTHER HUGE LOCOMOTIVE.

Another huge locomotive is building in England, intended to surmount moderately steep inclines, relying upon the mere weight of the wheels for its adhesion. No central rails or other gripping devices are used, but the inventor makes his engine of *eighty-two tuns* weight; assuming that the wheels will hold under this load for any ordinary amount of work. It is also claimed that from the huge proportions the machine must prove economical—not a necessary sequence by any means.

The general plan of the engine is much the same as Fairlie's locomotive, described on page 54 of the current volume—that is to say, the fire-box is duplicated, and occupies the center of the engine, the same as if two boilers were set furnace to furnace, one set of flues running forward, the other aft. The boiler is 59 inches in diameter, length not stated; the total heating surface of the tubes is 5,177 feet, that of the fire boxes, 355 feet.

There are to be four cylinders, 23¾ inches in diameter by 23½-inch stroke, and twelve wheels 47 inches in diameter, all drivers. The cylinders are outside connected, but in other respects not peculiar.

The total power of this machine is estimated to be 1,282 horse-power, under the condition of allowing 620 inches heating surface per horse-power.

Some of the details of the machine comprise novelties—which seem quite unnecessary—indeed, absurd. It is proposed to sand the rails in ascending very heavy grades, but instead of carrying a supply on top of the boiler, and letting it out as required through a pipe, the engineer who designed this locomotive proposes to manufacture it in lots to suit. To do this he has a quantity of gearing, consisting of saws, ratchet wheels, etc., driven by the engine. The saws work against blocks of sand, previously compressed by machines for the purpose, and, as a foreign cotemporary phrases it, "It is thus gradually disintegrated, and the triturated particles subsequently applied to the tires of the wheels by an apparatus resembling the inking rollers of a printing machine"—which means that it falls under the wheels.

As an improvement on this plan, the same journal urges that the sand blocks be applied direct to the rims of the driver, so that they can grind their own sand; that is to say, when a heavy engine is going up grade with all the load it can drag, we are to increase the adhesion by putting on the brakes.

The diameter of the cylinders is so great that the crank pins are immoderately long; so much so that the connecting rods have to be slightly bent in order to shorten the pins.

Another remedy for this is suggested by our cotemporary, to wit: "The cylinders should be made oval; they could be easily bored, and the construction of the piston would not present many difficulties."

There are some who would object to these conclusions. Lastly, we are told that this style of engine represents the most advanced opinions of the day, and that it indicates a style of practice to which we are rapidly drifting. If this be so, it would be better to try and stem the tide instead of drifting into such erroneous ideas and follies as this class of engine represents.

Every conceivable defect of adjustment and detail is crammed into an engine, and we are told that it is an advanced idea. What advancement is there in building two engines in one? and what progress is represented in planning an engine with cylinders so out of place that the connecting rods have to be bent? Why does economy necessarily spring from size and weight, and how much cheaper shall we get power out of locomotives by putting on machinery to make them grind their own sand, or applying gritty brakes to the wheels?

It is one advantage in favor of a central rail for surmounting steep inclines that a portion of the work on the main line is taken off and thrown on the central one, and it is a matter of some curiosity to know what weight of rail per yard would be required for the daily duty of a locomotive weighing 82 tuns, and exerting a thousand horse-power, and also the expense of keeping it in repair.

Some persons have a queer passion for doing absurd things, and then trumpeting them forth to the world. "Now I will invent a machine," says the schemer to himself, and without first ascertaining whether there is any need of such an one, and without the least idea of value, he proceeds to make locomotives grind their own sand, and "apply the triturated particles to the wheels."

Unhappily these impracticable persons do not spend their own money, but impoverish others. It is not strange that men should project monstrous locomotives on the plans here alluded to, but it *is* singular that they find supporters in journals that profess to lead scientific and practical men.

SECOND-HAND MACHINERY.

The great demand for machinery of all kinds has taxed the energies of manufacturers severely, and we hear from many dealers that their stocks of some kinds are sold to arrive. When new machines are not to be had, there is a demand for second-hand, and in this line also we find dealers asserting that business is brisk. Persons who buy second hand machinery are often disappointed. They expect to get something which has been slightly used, but is for all purposes just as good as new, at a trifle. When these expectations are not realized they blame the dealer, and feel that he has misrepresented the goods. The safest way in such transactions is to hire an experienced person, if the buyer is not capable of judging, to examine the articles and pay what they are really worth. If repairs have to be made, the expense of making them should be taken into account, and the purchaser will then be able to judge whether it is worth while to buy, or wait until he can get a machine built. A few hints to those inexperienced in purchasing may be of service.

In buying steam engines have the cylinder cover taken off, the piston taken out and examined, and the valve and its face inspected. If the cylinder is badly scored it will have to be bored out, which is costly work. The piston will require new rings, the heads will have to be made larger, and other expenses not necessary to enumerate will be entailed. If the valve face is cut or rusted, as the case may be, both it and the valve will have to be repaired. This will take time and cost considerable, sometimes more than the machine is worth. The brasses should be examined, also the bolts and the bearings. It is not to be expected that these details, or any others will be at all equal to new, but the question to be considered is whether they are so far worn as to be useless. It often occurs that good second hand-steam engines can be purchased at a low rate, but it does not follow that all offered are good.

Second-hand boilers are dangerous property. It is better to engage the services of a practical engineer to inspect them, or a boiler-maker who has plenty of work of his own, and does not desire repairs. Boilers are apt to be defective in so many parts not visible, where they cannot be tested by the hand or eye, that in all cases it is safer and more economical to buy new ones.

In purchasing lathes there are many points to be looked at. The feed gear of second-hand lathes is almost always out of order, and the leading screw is worn so much near the head stock, where it is most used, as to be worthless. The gears are generally more or less damaged as to their teeth, and some of them are apt to be missing. Gears for screw lathes generally run from 10 to 120, varying by 5 teeth. The spindles are apt to be badly cut, and the cones to run untrue. The shears are frequently cracked and bruised so as to need refitting, and the face plates so cut by careless workmen as to be useless to good ones.

In second-hand screw-cutting machines, the dies are often destroyed or missing.

Tools offered in lots should be examined to see if they can be used to advantage. Many people buy trumpery because it is cheap, when the room it takes, and the bother of having it around, amounts to more than the articles cost.

Pulleys are apt to be found cracked in the hub or the rim, and shafting to be so crooked and irregular in size as to cost more than new would to make it straight.

In all cases, the purchaser of second-hand machines must expect more or less repair to make them fit for use, and he must be the judge whether his needs justify him in paying the prices asked.

THE BROADWAY SUBTERRANEAN RAILWAY.

The engineer of the Croton aqueduct has made a report objecting to the construction of a subterranean railroad in Broadway on account of its serious interference with the sewers and water pipes. Whether this consideration will stop the prosecution of the enterprise remains to be seen.

As the business of New York is nearly all concentrated in the lower portion of the city, while the residences are in the upper part, most of the business people come down town every morning and return every night, making a great deal of travel in the streets running northeast and southwest. Though Broadway is crowded with omnibuses, and the side streets are occupied by railroads, the travel, even in the present size of the city, is very imperfectly accommodated, and far more ample provision must be made for it as the city increases in size.

Among the plans proposed, the subterranean railroad commands respect and confidence, from its practical success on a large scale in London, and if the sewerage difficulties can be overcome, it will probably be tried in this city.

It seems to us that a combination of the best elements in the several plans for an elevated railway is well worthy of consideration. One objection to an elevated railway is that it must be high enough to allow loaded wagons to pass under it at the cross streets, and this makes it necessary for the passengers to climb long flights of stairs to get into the cars. This objection is overcome by hanging the cars below the rails, as proposed by Mr. Andrew, of Cincinnati, Ohio, and illustrated on page 159, of our last volume. With this arrangement the rails may be twenty feet or more above the street, while the passengers are obliged to climb only eight or nine feet.

Perhaps Mr. Lyman's plan of supporting the rails by two lines of posts directly over the sidewalk may be better than that of Mr. Andrew, who hangs his two tracks on a single row of pillars set along the curbstones.

Mr. Andrew proposes to propel his cars by a series of endless ropes, driven by stationary engines. It has been suggested that a better plan would be to have each car carried by a light locomotive running above the rails. Manifest objections to this plan are the large cost of so many locomotives, and to the fuel to drive them; as well as the danger of dripping oil and dust down upon the passengers. These objections may, however, be less than those that rest against the subterranean plan; and certainly it would be much pleasanter to ride eight or nine feet above the ground than through a long subterranean tunnel.

© 1866 SCIENTIFIC AMERICAN, INC.

The enterprise is of so great magnitude and importance that every plan which seems in any degree plausible should have a thorough examination.

ISSUED FROM THE U. S. PATENT OFFICE
FOR THE WEEK ENDING FEBRUARY 13, 1866
Reported Officially for the Scientific American.

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

52,509.—Apparatus for Bleaching Oil, Parafine, Wax, Etc.—Charles Adams, Philadelphia, Pa.:

First, I claim the vessel, A, in combination with the pump, F, still, E, steam boiler, G, pipe, H K, valve, B, pipe, C, and worm, D, for the purpose specified.

Second, The pump, F, pipe, e, pipe, h, and valve, L, when used for forcing oil in a state of vapor into the vessel, A, for the purpose specified.

Third, The valve, B, when used for regulating the pressure in the vessel, A, where oil in vapor and steam, or parafine or wax and steam, are kept, for the purpose specified.

52,510.—Hoe. — Sherman W. Adams, Wethersfield, Conn.:

I claim the combination of the pivoted blabe, B, segmental arm, c, and handle, A, with devices or securing the said arm at a desired angle of obliquity with the handle, substantially as described.

[This invention consists in making the blade of a hoe adjustable, so that it can be set to any desirable angle with the handle as to hoe deep or shallow according to the requirement of the soil or of the crop under cultivation, and that by setting the blade well out from the handle it may be easily ground upon its inner edge (this being the proper edge to be ground), thus obviating the difficulty experienced with common hoes of grinding them upon that edge.]

52,511.—Plug Valve for Steam Engines.—William H. Akins, Dryden, N. Y.:

First, I claim a plug valve, B, provided with a channel, f, flaring shaped, in combination with a shell, C, provided with three apertures or ports, a b c, substantially as and for the purpose set forth.

Second, The arrangement of two valves, B B', with flaring-shaped channels, f f in combination with shells, C C', having ports, a b c a' b' c', and with a steam cylinder, A, constructed and operating substantially as and for the purpose described.

52,512.—Flat Iron.—John Alexander, Brooklyn, N. Y.:

I claim a single-spurred tennon on the handle, in combination with a suitable cavity in the body or base and with a spring arranged to operate together as represented, so that the handle may be united to and separated from the base at will by a pressing down and partial rotation of the handle, substantially as herein set forth.

52,513.—Sad Iron.—Charles Barry and O. W. Preston, Corning, N. Y.:

I claim the heater, F, provided with plates or doors, G G, at its ends, and fitted within the shell, c, of the iron, substantially as and for the purpose herein set forth.

[This invention relates to a new and improved sad iron and heater, whereby the iron may be heated by gas, and a very portable and convenient arrangement obtained, both as regards the heating and the use or manipulating of the iron.]

52,514.—Stove-pipe Damper.—Joseph Barton, Battle Creek, Mich.:

I claim the combination of the hinged ring sections, D D, with a circular damper plate, B, constructed and operating substantially as described.

52,515.—Cultivator.—Charles Belden, Middleburg, Ohio:

First, I claim the frame, B F, in combination with the changeable and reversible blades, H K, when constructed and arranged as and for the purpose set forth.

Second, I claim the herein-described cultivator, with changeable blades, H K, when constructed and arranged as and for the purposes set forth.

52,516.—Shirt Collar.—Sumner A. Bemis, Springfield, Mass.:

I claim the collar band extended so that its ends will reach behind the collar fold when the collar is buttoned around the neck, their lower edges shaped so as to conform together, substantially as and for the purpose herein specified.

52,517.—Apparatus for Reefing Fore-and-aft Sails.—George A. Bigelow, New Braintree, Mass.:

I claim the combination of the rotary boom, C, the detachable mast hoops, c, and the means of supporting and revolving the boom. And I also claim the combination of the same and the gimbals, l, or their equivalents, applied to the boom and mast, the whole constituting an apparatus for either reefing or furling a fore-and-a sail, substantially in manner as specified.

52,518.—Egg Beater.—Alfred Robert Blasse, Westminster, Md.:

I claim the combination in the vessel, A, of the smaller vessel, B, and its rotating beater, with the planetary system of revolving beaters, the whole being arranged and operating substantially as described and represented.

52,519.—Brazier for Cooking Stoves or Ranges.—N. O. Bond, Hyannis, Mass.:

I claim the brazier, A B, when constructed as herein described, with ribs, a a, which adapt it to receive vessels of various diameters, or of the same diameter as the stove hole, without obstructing the draught.

52,520.—Stove-pipe Elbows and Dies for Producing the Same.—Frederick Boshert, New York City:

First, I claim an elbow for stoves and other short metal pipes, constructed of flat plates cut in the form of quarter rings of the required width and then swaged transversely in semicircular form, with the radial recesses, to comprise the longitudinal halves of a tubular cylindrical ring, substantially as set forth.

Second, The dies, A and B, for preparing hard sheet metal plates for stove-pipe elbows, or other curved pipes, having projections, g, and corresponding recesses, h, by which to take up or absorb the surplus metal resulting from a double curvature, and avoiding crimping or breaking of the same, substantially as shown and described and for the purpose set forth.

52,521.—Steam Gage Cock.—John Broughton, New York City:

First, In combination with the body and shank of a gage cock provided with a suitable outlet passage, I claim a detachable valve, when said valve is supported by and has its bearing in said body, independent of the operating handle or screw, substantially as set forth.

Second, In an impression gage cock provided with a detachable and independent valve, supported by and having its bearing in the body thereof, I claim the tubular cap whereby to operate the valve, F, substantially as set forth.

Third, The combination of the body, A, detachable valve, F, and tubular cap, G, when arranged and constructed substantially as set forth

52,522.—Ocean Telegraph.—Geo. W. Bowlsby, Monroe, Mich.:

First, I claim the flying telegraph stations, B 1, consisting of ships or steamers, when used for the purpose specified, and in combination with the permanent stations, B 2, and the partially submerged electric cable sections.

Second, The electric cable sections, lying for the most part upon the bottom of the sea, and the ends coming to the surface of the water and supported by buoys, substantially as described.

Third, The combination of moving Figs. 2 3 and 4 sheets, 2, with buoys, B, and B2 cables, D D, and auxiliaries, I I P P K K H H and G, sheet, 1, and made substantially in the manner described and for the purpose specified.

Fourth, The water-proof packing chest, Figs. 11 and 17, with its appurtenences, for the joining of the ends of the cables, or any mechanical modification of the same, for the same object, and substantially similar.

Fifth, The combination of the great buoy, Fig. 1, with its traveler, F2, bell buoy, n, detachable signals, E E, separate water-proof compartments, h, joining flanges and fastenings, a p i; but I do not claim any of them specially and separately.

Sixth, The hollow-linked mooring cable, Figs. 5 6 7 14 18 19 20, with the inclosed water-proof chambers, m, for self support in the water.

Seventh, The flanged and staked moorings shown in Figs. 2 3 and 4, for the purpose of adding to the weight of the mooring, by taking hold of the earth by means of their own weight, and gradually settling into the bottom, instead of taking hold by dragging, like an anchor, nor by any other artificial means or force.

Eighth, The interior bracing of the deep-water buoys, as shown in Figs. 8 and 9, for the purpose of overcoming the pressure of the water and the prevention of leakage.

Ninth, The hollow-linked chain cable, Figs. 6 14 20, when used without the inclosed air chambers, m, shown in Fig. 6, and absent in Fig. 20.

52,523.—Tubing for Oil Wells.—James D. Bryson, Petroleum Center, Pa.:

First, I claim the combination of the pump tube, B, the shorter supplemental tube, A, and steady pins, d d, adapted to operate substantially as and for the purposes set forth.

Second, I claim the arms, e e e, hinged around the tube, B, so as to operate as described.

52,524.—Drying Kiln.—Henry D. Bulkley, Kalamazoo, Mich.:

I claim the use of a sawdust top or its equivalent, and of such varied thickness, as to retain so much steam generated from the drying substance or otherwise as shall expel the air, convert the heat, and protect the substances from scorching, and allow all surplus steam to pass out through the saw dust, with small waste of heat, and with the slightest pressure, substantially as specified.

52,525.—Cover for Fruit Jars.—F. A. Bunnell, Syracuse, N. Y.:

First, I claim, in apparatus for closing fruit jars and other vessels, the combination of the clamp, A, and cam lever, F, with a metallic bearing surface placed on the cork or stopper, when the cam acts directly on such surface, or on the stopper, without the use of an intermediary slide, substantially as described.

Second, I also claim making the flange of the stopper which rests on the mouth of the jar concave in cross section on its under surface so as to retain the packing ring in a mass, and prevent it from flattening out, substantially as described.

Third, I also claim the extension of the stopper within the mouth of the jar, in combination with the flange, d, substantially as described.

Fourth, I also claim forming inclined planes below the rim of the mouth of the jar, for the purpose of drawing the clamp down on the stopper, substantially as described.

52,526.—Harvester.—William H. Burkhart, Bucyrus, Ohio:

I claim the adjusting belt in combination with the spring pendant pulley support for regulating the tension of the reel band substantially as described.

52,527.—Ventilator.—Benajah J. Burnett, Mount Vernon, N. Y.:

First, I claim a ventilator having its air passages composed of tubes arranged around the interiors of surrounding trunks, and furnished with caps and deflectors, substantially as herein specified.

Second, The arrangement in one ventilator, of two or more series of tubes with separate surrounding trunks and caps for ventilating different floors or stories of a house or other structure, substantially as herein specified.

Third, The sliding external sleeves or shutters in combination with the trunks, tubes and caps, substantially as and for the purpose herein specified.

Fourth, The perforated air distributors constructed with deflectors, and combined with the lower ends of the tubes of the ventilator, substantially as herein set forth.

52,528.—System of Ventilating Houses, Etc.—B. J. Burnett, Mount Vernon, N. Y.:

First, I claim the conical deflectors, a, situated at the lower ends of the vertical air shafts, B, substantially as set forth, for the purpose specified.

Second, I claim cold air chamber, c, with its air passages, h, in combination with the vertical air shaft, B, substantially as set forth, for the purpose specified.

Third, I claim the chamber, D, inclosing the funnel-shaped deflectors, a, arranged with reference to the vertical air shafts B, space, d, and air passages, d', substantially as set forth for the purpose specified.

52,529.—Flat Iron.—Thomas Butters, Concord, N. H.

I claim a box flat iron, provided with an internal removable heater, and with means for removing the same consisting of the lever, A, supported upon the box and the spring, B, attached to the handle, b, arranged and operating in the manner described.

52,530.—Medical Compound.—William Cawein, Louisville, Ky.:

I claim a compound produced by mixing the above-named ingredients together, about in the proportion and substantially in the manner specified.

[This invention relates to a compound which will speedily and surely cure diseases arising from a disturbance of the stomach.]

52,531.—Adjustable Toilet Glass.—George Chappel, Peekskill, N Y.:

I claim the adjustable mirror, A, in combination with the tubular extension rod, G, chain, b, and weight, D, as and for the purpose described.

[This invention consists in the arrangement of a looking glass or mirror at the end of an adjustable rod, which is fastened to the ceiling or to any other convenient place in a room, in such a manner that the position of said mirror can be adjusted at pleasure, and a person standing before an ordinary toilet glass, is enabled to see the back and front of his or her head and neck at the same time.]

52,532.—Quartz Mill.—Thomas J. Chubb, Brooklyn, N. Y.:

First, I claim the employment of corrugated rings, arranged one within another, for the purpose of disintegrating universal substances, substantially as described.

Second, The arrangement of a series of grinding surfaces within a chambered cylinder, the chambers of which communicate with each other, substantially as described.

52,533.—Head Block for Saw Mills.—Gilbert H. Clemens, United States Army. Antedated Aug. 13, 1865:

I claim the head block, A F, knee, D E, and setting screw, C, when constructed and arranged substantially as and for the purposes set forth.

52,534.—Musical Staff.—John C. Clime, Philadelphia, Pa.:

First, I claim a musical staff consisting of the lines 1 2 3 4 5, of the ordinary staff, combined with the supplementary lines, x, substantially as and for the purpose specified.

Second, The diagonal lines, w, arranged in respect to the staff, and to the letters designating the notes on the staff, substantially as and for the purpose set forth

52,535.—Heating Stove.—James C. Cochrane, Rochester, N. Y.:

I claim the air chamber with wire cloth or perforated metal facing the fire, and so near it that gas passing through will be ignited, and through which the draft from the fire will pass, and with horizontal or perpennicular flues communicating between the air chamber and the air of the room, the whole constructed as and for the purposes above described.

52,536.—Bridge.—L. K. Cole and Howard Soule, Jr. Syracuse, N. Y.:

First, We claim the shoe, C D E F G, constructed and operating substantially as described.

Second, The continuous chord, B, and nut, A, in combination with the shoe, and brace, V, or other equivalents, substantially as and for the purposes described.

52,537.—Straw Cutter.—James Conner, Richmond, Ind.:

First, I claim the construction of a straw cutter in such a manner as that the box or straw receptacle shall have a vibratory or oscillating motion as set forth.

Second, The spring, M, with the guard, P, attached, constructed and operated in the manner and for the purpose as described.

Third, The lever, J, arm, H, and the connecting rod, G, in combination with an oscillating box in straw cutters.

52,538.—Horse-shoe Vise.—Emmett Coon and Nathan Hill, Comstock, Mich.:

We claim a vise for sharpening the calks of horse-shoes, having the slotted standard, a, with the adjustable bolt nut and screw therein, a curved lever, B, spring, C, elbow lever, D, and hanging stirrup, E, constructed combined and arranged substantially as herein specified.

52,539.—Plow.—Thomas Cottman, Cincinnati, Ohio:

I claim the extension or addition, C, to the block or head, C, patented by A. Gardner, October 26th, 1852, so as to receive the share, A and the landside, D, made in separate parts, substantially as set forth and described.

52,540.—Paper Socks.—J. W. B. Covington, New York City:

I claim a paper sock or stocking as a new article of manufacture.

52,541.—Tightening Rod.—S. D. Cushman, New Lisbon, Ohio:

First, I claim the ribs, a and b, in combination with the rod, when constructed and arranged substantially as and for the purpose set forth.

Second, The section, A and B, when constructed and combined in the manner and for the purpose, substantially as described.

52,542.—Cultivator.—Calvin B. Deyo (assignor to himself and Edgar B. Rinner), Marengo, Ills.:

First, I claim the combination and arrangement of the triangular frame, B B C, draft pole, A, standards, D, and braces, E, constructed and operating as and for the purposes set forth.

Second, I claim in combination with the said draft pole, triangular frame, B C, standards, D, and shovels D', the arrangement of the inclined posts, F F, provided with the pulleys, c c, the pulley, G, and cord or chain, I, operating substantially as and for the purposes specified.

Third, I claim the arrangement of the toothed plates, L M, slot, m, bolt, n and o, with the draft pole, A, cross bar, C, and inclined posts, F, sliding in the loops, a, all arranged and operating substantially as herein set forth and described.

52,543.—Apparatus for Making Paper Pulp.—John W. Dixon, Philadelphia, Pa.:

First, I claim the combination of the circulating pump and revolving boiler

Second, The combination of circulating pump, heating coil, and revolving boiler.

Third, The combination of one or both perforated diaphragms, and a revolving boiler and pump, p.

52,544.—Apparatus for Making Paper Pulp.—John W. Dixon, Philadelphia, Pa.:

First, I claim the combination of the digester, A, the perforated diaphragms, D, and the lateral pulp passage, E, arranged and operating as described.

Second, The combination of the digester, A, and circulating tubes, M' M " M,"" extending from the lower to the upper part of the digester for causing a circulation of the digesting liquor by the effects of the heat on these tubes.

Third, The combination of the digester, A, the tube, C, and the lateral pulp passage, E, arranged and operating as described.

52,545.—Making Paper Pulp from Wood, Straw, Etc.—John W. Dixon, Philadelphia, Pa.:

I claim the process of treating wood or other vegetable substances, by boiling in a solution of silicate of soda under pressure as a process or preparatory process for making pulp in the manufacture of paper from wood, steam or other vegetable substances, substantially as described.

52,546.—Process for Making Paper Pulp from Wood, Straw and Other Vegetable Fibrous Substances.—John W. Dixon, Philadelphia, Pa.:

I claim the process of treating wood or other vegetable substances by boiling in a solution of carbonate of potash, under pressure, as a process, or preparatory process, for making pulp for the manufacture of paper from wood, steam or other vegetable substances, substantially as described.

52,547.—Breeching-loading Fire-arms.—W. C. Dodge, Washington, D. C.:

I claim, First, The breech block, A, provided with the notch or shoulders, n, for locking it in position, and the bridge, K, for enabling it to pass the cartrages in the magazine, substantially as shown and described.

Second, I claim giving to the rotating breech block, A, when so constructed that all its parts shall move together, a vertical movement, for the purpose of locking it substantially as herein described.

Third, I claim uniting the lever guard, B, to the breech block, A, as shown in Fig. 4 or in any equivalent manner, by which the lever, B, is permitted to move longitudinally for the purpose of elevating the block, A, substantially as set forth.

52,548.—Revolving Grate for Stoves.—Ellwood Draper, Oskaloosa, Iowa:

I claim, First, The combination of a revolving cylinder grate, constructed substantially as described, with a cooking or heating stove, for the purpose set forth.

Second, The combination of the piece, G, with the grate, D, substantially as described, and for the purpose set forth.

52,549.—Roofing.—O. Eaton, Troy, N. Y.:

I claim the combination with the wooden boards, c c, and raised ribs, g g, of the wooden cap, h, and spaces, n, when the parts are constructed and arranged in the manner and for the purpose herein described and represented.

[This invention relates to a certain new and useful improvement in roofs for buildings, etc., but which are particularly applicable and more especially intended to be adapted to railroad cars, and to all other purposes where the surface covered therewith is subjected to violent vibrations, the principal object being to obtain a roof, which shall be perfectly impervious to rain and moisture, and so constructed and arranged as not to be effected in the least by the vibrating and jarring motion of cars.]

52,550.—Washing Machine.—John and Jacob Ehart, Fort Madison Iowa:

I claim the shaft, C, made adjustable, vertically within the tub, A, by means of the sleeve, H, when used in combination with the disk, F, provided with arms, E E, the several parts being used as and for the purposes herein specified.

© 1866 SCIENTIFIC AMERICAN, INC.

52,551.—Hand Mirror.—John E. Faris, Baltimore, Md.:
I claim a hand mirror, having a plane surrounding the same adapted for inscriptions and ornamentation, and protected by flanges, all substantially as shown and described.

52,552.—Cutlery.—Daniel Fitzpatrick, West Winsted, Conn.:
I claim forming or securing a half-bolster upon or to cutlery, by indenting one side of the piece of steel of which the tang and blade are composed, and welding the half-bolster piece to such side, and forming the half-bolster upon the opposite side by swaging substantially in the manner described.

52,553.—Manufacture of Artificial Non-inflammable Wood.—Anthony L. Fleury, Pittsburgh, Pa.:
I claim, First, Treating fibrous materials in the way and for the purposes above specified.
Second, I claim also the improved material which I denominate "artificial non-inflammable wood," the same being produced by the process above-described or by a subs antially equivalent process.

52,554.—Mode of Utilizing Coal Dust.—Anthony L. Fleury, Pittsburgh, Pa..
I claim, First, The utilization of refuse coal gas tar and petroleum, by compounding them with the slag or cinder of puddling, reheating and steel furnaces, or with iron ore, and making from said compound a metalliferous coke.
Second, For utilizing the slag or cinder of puddling, reheating and steel furnaces by compounding them with refuse coal-gas tar or petroleum, and making of said compound a metalliferous coke.
Third, For compounding iron ore with refuse coal-gas tar or petroleum, for making therefrom a metalliferous coke, as and for the purpose above specified.

52,555.—Window Curtain.—Harry Foster, Port Jervis, N. Y.:
I claim the combination of roller, A A, curtain, C, and cords, b b, so as to operate in the manner herein described for the purpose specified.

52,556.—Valve for Steam Engines.—James Gallatin, Jr., New York City:
I claim the valve, C, with cavities, a a', in combination with the flat seat, B, provided with ports, b b' c c', and with a secondary piston, D, all constructed and operating substantially as and for the purpose described.
[This invention relates to an oscillating or rotary valve with a flat face, which is ground down upon a corresponding flat seat, and which is provided with two segmental cavities, which alternately form the communication between the supply and exhaust ports of the seat.]

52,557.—Neck Tie.—J. B. Gardiner, Springfield, Mass.:
I claim as a new article of manufacture a neck tie or bow made of paper, thin metal, or other suitable substance, and embossed or struck up substantially in the manner and for the purpose herein set forth.

52,558.—Gang Plow.—Roland R. Gaskill, El Paso, Ill.:
I claim hinging the tongue, A, to plow beam, B, at the middle thereof, or directly above the share, H, in combination with brace, L, hinge, x x, bars, F F, brace, K, and axletree, G, the several parts being arranged as and for the purpose set forth.

52,559.—Apparatus for the Manufacture of Iron and Steel.—William Gerhardt, Pittsburgh, Pa.:
First, I claim the furnace, C, with one or more chemical injectors, introduced in the manner and for the purpose specified.
Second, The combination of the pipe, T, box, S", pipe, S, valve, K, pipe, Q, pipe, O', double valve, P, pipe, O, and funnel, N, forming a chemical injector as described and for the purpose specified.
Third, The funnels, n n n" n", in combination with the funnel, N, for the purpose specified.
Fourth, The combination of the counting and recording instrument and dial, V, with the mechanism, M and U, and the valves, P and R, of the chemical injector for the purpose specified.
Fifth, The combination of the two arches, F F' and G G', with the basin, E, as described.
Sixth, The flues, p p, as described and for the purpose specified.
Seventh, the flues, b b, and pipe, L, arranged as and for the purpose specified

52,560.—Manufacture of Iron and Steel.—William Gerhardt, Pittsburgh, Pa.:
First, I claim running the melted pig-iron from a blast furnace, cupola, or air furnace, directly, or by a spout, into the puddling furnace for treating it in the manner specified.
Second, Injecting by blast of air directly into and under the surface of molten iron, in a puddling, oxide of iron, iron ore, carbonizing or purifying agents, in the manner and for the purpose specified.
Third, Gaging and recording the introduction of oxide of iron, iron ore, and other chemical agents, introduced by blast of air into the molten iron, as specified.
Fourth, Operating at pleasure the partial or total decarbonization of cast iron under the slag, by the injection, by blast of air, of oxide or iron, iron ore, and purifying agents, without letting the iron come in contact with the sulphurous flame of the furnace, in the manner specified.

52,561.—Axles for Vehicles and Journals for Machinery.—R. P. Gillett, Sparta, Wis.:
I claim the collar, B, on the axle, A, constructed with a recess, a, for the insertion of the butt end of the boxing, e, substantially as and for the purpose described.
[The invention consists of a new and improved mode of coating the arm of the axle, the portion in which the wheel runs, with Babbitt metal or other similar composition, and also in a mode of forming a lubricating passage for axles thus coated whereby it is believed that a very superior axle is obtained, as well as superior journals for machinery.]

52,562.—Washing Machine.—W. H. Greer, Chicago, Ill.:
I claim constructing the rubbing board of a washing machine of a series of conical, radial cogged rollers, whose operative faces present a flat surface to the vibrating rubber above, substantially as and for the purpose described.
[This invention relates more particularly to the rubbing boards of washing machines, composed of a series of rollers, either arranged radially from a common center or parallel with each other, the object being to prevent the clothes from being wound around and about them as they are in any proper manner rubbed upon them, it consisting in forming the rollers with a series of grooves or corrugations extending around their peripheries, which corrugations mesh into each other, and thus accomplish the desired end.]

52,563.—Seeder and Fertilizer Combined.—Spencer Guild, Milford, N. H.:
First, I claim the combination of a manure or fertilizer distributer with a hand-seeding machine, substantially as described.
Second, The plate or coverer, H, applied to a hand-seeding machine, either with or without the manure distributor, to operate in the manner substantially as set forth.
Third, The levers, E and D, for operating the slides, B, one or more, and plate, F, substantially as described.
Fourth, The combination of the levers, E D, slides, B, one or more plate, F, and the coverer or plate, H, all connected and arranged to operate in the manner substantially as and for the purpose specified.
[This invention relates to a new and improved implement for sowing or planting seed by hand, and distributing a fertilizer at the same time. The invention consists in a novel mechanism employed whereby all the parts necessary to effect the result or perform the work above specified may be operated by a single lever and with the greatest facility.]

52,564.—Tobacco-smoking Device.—Holman J. Hale, New York City:
First, I claim coloring meerschaums by subjecting them to the action of tobacco smoke inhaled or passed through them, substantially as above set forth.
Second, I also claim the cover or cap, C, fitted on the bowl of a pipe by means of a porous stopper or other convenient device, and perforated by a tube which enters said bowl substantially as and for the purpose above set forth.
Third, I also claim in combination the cover or cap, C, the tube, E, and the heat disperser, or the radiating device, G, substantially as shown.

52,565.—Apparatus for Washing Tumblers.—Albert Hallowell, Lowell, Mass.:
I claim one or more cups, E, jet pipes and tubular annuli, d, arranged and combined together substantially in manner and so as to operate as and for the purpose specified.
I also claim the combination and arrangement of the basin, D, and its discharging tube, B, with the conduit, A, its branch pipes and cups, or the same and one or more tubular annuli, d, as specified.
I also claim the combination and arrangement of the receiving cup, E, with the tubes, A B, the basin, D, and the branch pipes and cups on the same, and the annuli, as explained.

52,566.—Tailors' Measure.—Geo. W. T. Harley, Frederick, Md.:
First, I claim the combination of the graduated extensible strips, A A, with the slides, B B, and the intermediate sliding protractor, b, and pivoted scale blade, c, with the perpendicular rods, G G, substantially as described.
Second, The combination of the adjustable blades, E E, and protractor plates, D D, with the central protractor plate, b, and blade, and the extensible graduated strips, A A, substantially as described.
Third, The long tape measure, H, in combination with the perpendicular rods, G G, and the extensible strips, A, A, substantially as described.
Fourth, The short tape measure, J, in combination with the extensible strips, A A, and perpendicular rods, G G, substantially as described.

52,567.—Weather Strip.—Mortimer S. Harsha, Sycamore, Ill.:
I claim the combination and arrangement of the strip, D, the spindle, d, and box, c, when arranged with respect to the bearing, a, pin, b, and cleat, E, as and for the purpose herein specified and described.

52,568.—Buckle.—Sheldon S. Hartshorn, New Haven, Conn.:
I claim the combination of the bow part, figure 2, with the tongue part, figure 3, when the tongue part is so formed that two portions of it lap, as at b, and the tongues rest on and across the shanks of the bow part, and the whole is constructed substantially as herein described.

52,569.—Centrifugal Machine.—George B. Hartson and E. J. Woolsey, New York City:
We claim the method of constructing the centrifugal separator with a hollow hub in the center of the lower plate thereof, as described, the said hub being provided with a pulley for the driving belt below the bottom plate, and fitted to run on, and combined with the stud of the base plate, in the manner and for the purpose specified.
We also claim the said centrifugal separator, in combination with the cap or cover provided with holes or channels covered with funnel-shaped hoods, as described, to force currents of air in and through the said apperatus, to aid in effecting the separation, as described.

52,570.—Bolt.—George Havell, Newark, N. J.:
I claim the bolt, figure 1, constructed substantially as described.

52,571.—Beehive.—Henry Hodgson, Tremont, Ohio:
First, I claim suspending the comb frames from removable bars, M M', in combination with the vertical partition, I J, substantially as and for the purpose abeve set forth.
Second, I also claim dividing a hive by means of a partition, I J, made substantially as shown, in connection with making entrance ways, provided with perforated movable covers on two opposite sides, or ends of each division, so that when one division is isolated from the other the entrance to each can be established on opposite sides, substantially as described.
Third, I also claim, in beehives, which have a lower main hive, and a surplus upper box, a perforated movable metallic sheet or plate, F, on the top of the main box or hive, and a perforated metallic bottom, on the surplus box, the perforations in which are made to coincide or are made not to coincide, for the purpose above explained, by changing the position of the surplus box, substantially as described.
[This invention is to enable one to rear a queen bee in a separate part of a beehive without disturbing the old swarm, and to provide a mode of promoting that condition in a colony of the bee known as "swarming."]

52,572.—Evaporator for Hot-air Pipes.—Jesse L. Hutchinson, Baltimore, Md.:
I claim the combination with an appropriate enlargement of the hot-air pipe of a water reservoir so placed within as to expose a surface for evaporation and capable of being supplied with water from the outside by automatic device, or otherwise, as may be desirable.

52,573.—Braiding Machine.—Otis M. Inman, Providence, R. I.:
First, I claim guiding and directing the bobbin carriers from one circular passage to another by means of projections or switches, c c, formed on the frame plate, C, acting upon a rudder, g3, on the carrier, substantially as described.
Second, Constructing the bobbin carrier with the shoulder supports, f g2, and an intermediate recess for receiving the teeth on the carrier wheels, substantially as described.
Third, The manner, substantially as herein described, of arranging the contrivance which controls the delivery of the thread from the bobbin.

52,574.—Burning Fluid.—John Jann, New Windsor, Md.:
I claim the combination of benzine, sweet and linseed oil in about the proportions mentioned.

52,575.—Metallic Packing for Stuffing Boxes.—C. F. Jauriet, Aurora, Ill.:
First, The construction and arrangement of the follower, D, substantially in the manner and for the purpose described.
Second, The construction and arrangement of the ring, plate, C, substantially in the manner and for the purpose herein described.
Third, The arrangement of the cylindric springs, k, with the turning follower, D, compressible packing and steam admission passages of the stuffing box, E and A, substantially as described.
Fourth, The combination of the packing, ring plate, springs and follower, with a stuffing box, substantially as and for the purpose described.
Fifth, The combination of the compressible packing, springs, k k, and steam passages, as described, for the purpose set forth.

52,576.—Dish-stand.—Isaac W. Lamb, Rochester, N. Y.:
I claim a dish-stand having a cup, or its equivalent, suitable for containing water or other fluid, formed around its standard, substantially as and for the purpose herein described.

52,577.—Mode of Hanging Curtain Blinds and Maps.—Jacob F. Landis, Harrisburg, Pa.:
I claim the construction of the screw, D, with its eye, E, in combination with its thumb screw, G, and slat, c, for holding the curtain when arranged and combined as herein described and for the purposes set forth.

52,578.—Water Wheel.—Leroy M. Larsh, Richmond, Ind.:
First, I claim the termination of the scroll, C, in a saddle shaped apex effecting a division of the current, as desired.
Second, The combination of the saddle, A, and plates, B B', with the trunk, D, and scroll, C, operating as set forth.

52,579.—Spirit Level.—Rudolph Ledig, Newark, N. J.:
First, I claim the combination, in a spirit level, of the vibrating screw, k, with the arm, G, the nut, J, and the frame, A, substantially as described and for the purpose set forth.
Second, The combination, in a spirit level, of the arm, C, with the frame, A, arms, F G, index, H, and clamp, L M N, substantially as described and for the purpose set forth.
[This is an exceedingly useful invention, and consists of a spirit level, of which the arm that carries the spirit bottle is pivoted at one end to the frame of the level, and at the other end is connected with an index and scale, so that the workman, by the use of this instrument, not only knows whether a piece of work is level, but also how much it varies from a level at any given point and for any given distance.]

52,580.—Bugle, Horn, Cornet, Etc.—Henry G. Lehnert, Boston, Mass.:
I claim the construction of any side of their tuning pipes with a tapering bore, which, when in place in the instrument, becomes a prolongation of the taper of the said passage.

52,581.—Supplementary Seats for Water Closets.—L. H. Sondheim, New York City:
I claim a supplementary seat for water closets so constructed as to be folded up, substantially as described.
[In hotels, public buildings, or large establishments where the water closet is for public or general use, and also sometimes in private dwellings, much embarrassment is often felt by finding the seats in a condition not fit to be used, and the object of this invention is to provide a reliable and portable supplementary seat, which may be conveniently taken by the person intending to use the water closet, and by him readily placed upon the seat thereof, its construction being such that the person of the sitter is prevented from coming in contact with the privy or water-closet seat.]

52,582.—Revolving Fire-arm.—Benj. T. Loomis, New York City:
First, I claim, in combination with a part of a pistol stock attached to the barrel and containing a lock, as described, a swinging piece that may be opened and shut and grasped in the act of discharging the pistol, the combination being substantially such as described.
Second, The slotted chamber piece, U, constructed substantially as described.
Third, In combination with a pistol stock, one part of which swings upon the other, I claim the trigger and springs, so combined together, as described, that the trigger protrudes when the stock is opened and returns to its place after the discharge.

52,583.—Cider Mill.—Samuel Males, Cincinnati, Ohio:
First, I claim the combination of the square-faced ribs, J, and round grooves, K, in crushing and stripping rollers, H and G, of the within-described cider mill.
Second, In combination with the crushing and stripping rollers, H G, I claim the gear wheels, F F' F,, with interdentil spaces, whose bottoms, f, are chamfered or sloped outward, as and for the purpose herein specified.

52,584.—Press.—George Mathewman, Brooklyn, N. Y.:
First, I claim the arrangement of the lever, G, links, H, and arms, A', or their equivalents, the lever, G, being operated in front of the machine and at a low point, substantially in the manner and for the purposes herein set forth.
Second, I claim the shaft, m, wheel, M, and nut, D, adapted to raise and lower the spindle, C, and its connections, substantially as and for the purposes herein set forth.
Third, I claim the within-described combination and arrangement of the connection, L, or its equivalent, the gear wheels, L' L', and the frame, I, or its equivalent, adapted to raise and lower the clearer, I, in the horizontal positions, substantially in the manner and for the purposes herein set forth.
Fourth, I claim the within-described combination and arrangement of the springs, P P', spindle, C, and threaded wheels, T' T', adapted to increase and diminish the force with which the plate, I, is pressed down in advance of the spindle, C, substantially as and so as to realize the advantage of requiring little hight for the entire mechanism, as herein set forth.

52,585.—Bedstead.—J. B. McLanathan, Horicon, Wis.:
I claim the comoination and arrangement of the slats, D, rails B, springs, C and F, pegs or pistons, E, and shanks, c, as and for the purpose specified.
[This invention consists in a novel arrangement of the cross rails and slats of a bedstead, whereby a very easy and springing frame on which to place the bedding is produced.]

52,586.—Thill Coupling.—John McDermott, Washington, D. C.:
First, I claim the use of the anti-friction facings or bushing pieces, e e, as described, in combination with the head of the third shank and the jaws of the lug, to increase the extent and durability of the rubbing surface.
Second, Coupling the head of the thill shank in the jaws of the lugs by the use of bushing pieces, e e, so made and arranged in respect to said jaws and said head, that said head will act as a key to secure said bushing pieces, while at the same time said bushing pieces act as a coupling to unite the thills to the axle without the aid of a bolt.
Third, The use of bushing pieces, e e, made with a flange on their inside surfaces to lap over and hold the ends of the thill shank, and a tubular socket or projection on their outside surface to fasten in the jaws of the lugs, and to receive the bolt, substantially as described.

52,587.—Knife Sharpener.—William Nash, New Britain, Conn.:
I claim the knife sharpener herein described, the same consisting of the screw-threaded rollers, C C, frame, A, and handle, B, arranged and combined substantially as set forth.
[This invention relates to the production of a new article of manufacture, the same being an improved device for sharpening knives in which two screw-threaded rolls are let in a suitable frame secured in a handle, between which rolls the knife is to be drawn for sharpening it. The whole device, in general appearance, resembles and matches articles of table cutlery, and can be placed on the table with equal propriety.]

52,588.—Curing Sorghum.—William Nevins, Lyons, N. Y.:
I claim the described method of stacking corn, sorghum, etc., by means of the frame, a b c c, substantially in the manner and for the purpose herein set forth.

52,589.—Stirrup.—Barak T. Nichols, Newark, N. J.:
I claim the stirrup, A, figures 1 and 2, substantially in the manner and for the purposes described.

52,590.—Shovel and Tongs Combined.—Harrison Ogborn, Richmond, Ind.:
I claim constructing a combined shovel and tongs having the leg, a, attached to the handle of the shovel by means of the hinge joint, C, pivoted substantially as set forth.

52,591.—Calendar Watch.—Edward Oppenheimer, New York City:
I claim a watch provided with an additional dial, i, under the main dial, said additional dial being marked with figures from 1 to 31, and so arranged that it receives an intermittent motion once every twenty-four hours, whereby said figures are successively brought opposite an aperture in the main dial, as and for the purpose described.

52,592.—Car Coupling.—John H. Parsons, Quincy, Mich.:
First, I claim the arrangement of the draw head, A, with its second V-shaped hole or opening on the bottom. The grooves, d d, in connection with the pin-sustaining bars, H G, and rods, E F, substantially as shown and described,
Second, I claim the arrangement of the top beveled pin or catch, y, and the spring, m, substantially as described and set forth.

52,593.—Foot Warmer.—J. H. Parsons, Quincy, Mich.:
I claim a foot warmer formed by connecting the drum or box, A, of the warmer with an ordinary stove-pipe by means of the small pipes, C and D, substantially as described and for the purpose set forth
[This invention consists of a box or drum resting on the floor of the room and connected with the stove-pipe by small pipes furnished with dampers, by means of which the heated smoke and gases may be made to pass through the drum, so that the feet may be warmed conveniently and comfortably without any danger burning the soles of the boots or shoes while warming the feet.]

© 1866 SCIENTIFIC AMERICAN, INC.

52,594.—Mode of Securing Pipes and Bolts in Oil Wells.—William Parsons, Cleveland, Ohio :

I claim the eccentric or cam, B, as described, constructed and operated upon substantially and for the purpose set forth.

52,595.—Wagon Brake.—L. C. Percival, Philadelphia Pa.:

I claim the levers, E E, pivoted to the braces. E F, at the rear part of the reach or perch, C, and provided with shoes, G, at their outer ends in line with the rear wheels B, in combination with the rods, I J, and the levers, K K, to which the breast straps of the team are attached. all arranged and applied substantially as and for the purpose set forth.

I also claim the spring pins, L, attached to the draught pole, D, in combination with the lips, i, in the rod, J, substantially as and for the purpose specified.

I further claim the strap, M, applied to the thills, N, and connected with rod I, substantially as and for the purpose set forth.

[This invention relates to a self-acting brake for wagons and other wheel vehicles which are drawn by horses, and it consists in a novel arrangement of a rod-brake lever and levers to which the breast straps of the team are attached—all being arranged in such a manner as to operate automatically when the vehicle is descending an eminence.]

52,596.—Lifting Jack.—Job W. Pettengill, Rockford, Ill.:

I claim the adjustable link, D, and pawl, C', in combination with the slide. C D, lever, D', and head, A, the whole being constructed and arranged so as to allow the slide, C, to be raised to or near to the top of the head, A, by changing the pawl, C', to the upper part of the head, a, securing the link, D, substantially as set forth.

52,597.—Buckle.—I. N. Plotts, New York City:

First, I claim setting, twisting, turning or stamping the bars, B, side strips, A', of the buckle at any desired angle or angles, substantially as described.

Second, I claim attaching to or forming upon the inner edges of the under surface of the side strips. A', of the buckle lips, i, substantially as and for the purpose specified.

Third, In a buckle of substantially the character described, I claim milling, serrating or otherwise roughening the edges of the lips, c c'. as well as the raised edges of the bars and depressed edges of the side strips, substantially as and for the purpose specified.

52,598.—Furrowing Device for Corn Planting.—Joseph Plumb, Clarksville, N. J.:

I claim the marking sled with the mold boards or shoes attached to the runners, substantially as described and represented,

52,599.—Button-holes for Paper Collars.—B. F. Porter, Nashua, N. H:

I claim the improved button-hole as made with the openings, a and c, and the lip or fly, b, arranged substahtially as specified.

52,600.—Vehicle.—T. W Porter, Bangor, Me.:

First, I claim the socket, A, figure 3, made of malleable iron, with the projections, d d and b b, as an article of manufacture and sale for the uses and purposes set forth.

Second, I claim as an article of manufacture and sale, the malleable-iron clip or shaft coupling as shown in Fig. 10, with the lips, I I, and tube, d, cushion, n, plate, r, and, wrought-iron clasp, e', substantially as shown and described.

Third, I claim as a new article of manufacture and sale the malleable-iron tip or coupling, k, Fig. 10, substantially as shown and described and for the purposes specified.

Fourth, I claim as an article of manufacture the pole end, H, of malleable iron, with the straps, b b, and doubletree pivot, a, and projections, d d, constructed and arranged as described and for the purposes specified.

Fifth, I claim as an article of manufacture and sale the malleable-iron perch coupling, L, Fig. 8, with projection or strap, c, and step, i, constructed and arranged as described and shown and for the purposes specified.

52,601.—Machine for Raking and Loading Hay.—John S. Preston, Mechanicsville, Pa.:

I claim the endless toothed apron, E, when used in connection with the endless elevator, F, and arranged so that the teeth of the apron will be withdrawn from the elevator at a certain point, in combination with the rake. G, all being applied to a mounted frame and arranged to operate substantially as set forth.

[This invention relates to a new and improved device for raking and loading hay directly upon a wagon from the field. The device is designed to be attached to the wagon and drawn along with it, and it consists in a frame mounted on wheels, provided with an inclined endless toothed apron, and inclined endless elevator and a rake.]

52,602.—Hoop-skirt Frame.—A. Raffel, New York City:

I claim the adjustable frame constructed with movable ribs, substantially as described, in such a manner that it may be expanded or contracted without changing the form of the skirt at the upper end.

52,603.—Method of Attaching and Lubricating Car Wheels.—William R. Reece, Tremont, Pa.:

I claim the oil chamber, B, in the wheel, A, closed at its ends by plates, C C', which are connected by bolts, D, and arranged as shown, so as to secure the wheel on the axle, a communication being formed between the chamber, B, and the interior of the wheel hub, b, and all arranged substantially as and for the purpose specified.

I further claim the spring, F, applied to the opening, d, in the oil chamber, B, substantially as and for the purpose set forth.

[This invention relates to a new and useful improvement in attaching car wheels to their axles, with a view of keeping the same in a properly lubricated state, and to prevent the admixture of dirt, dust, etc., within the center of the wheel.]

52,604.—Dust Screen for Stove and Furnace Doors.—Jesse Reynolds, Philadelphia, Pa.:

I claim the dust screen, G, constructed and adapted to a furnace, heater, or stove, substantially as and for the purpose herein set forth.

52,605.—Oven for Annealing Iron.—Samuel Reynolds, Pittsburgh, Pa.:

First, I claim the flues, openings, or passages, S S S.

Second, The passages, M M M.

Third. Passing the fire under the arches, K K, and directly in the oven by the flues, M M, and out of the oven by the flues, S S S, instead of over the arches, K K.

52,606.—Cultivator.—Harrison Rice, Springfield, Ohio:

First, I claim the combination of the three-sided double frame, a a a a, and a' a', with the removable seat, g, and adjustable axle bearings, in the manner described, for the purpose specified.

Second, The combination of the main frame with the vertical frame. p, windlas, e, chains, f, and joints, c c, arranged and operating conjointly, in the manner substantially as described, for the purpose specified.

52,607.—Paper Collar.—Celius E. Richards, North Attleborough, Mass.:

I claim my improved turn-down collar, as constructed, with its inner fold, c, of a less width than its outer fold, d, and with the back button hole formed in the outer fold, as specified.

52,608.—Button.—Celius E. Richards, Attleborough, Mass.:

I claim, First, Fastening the collet or neck of the button into a concavity and a central perforation, combined substantially as described, for the purpose specified.

Second, The mode described of fastening a button with a collet or neck, as described, by means of a shield having a number of spurs that pass through the button from the back side of the fabric, and are secured in front of the button in a manner to conceal their ends. substantially as specified.

Third, In combination therewith a soft washer, as described, between the shield or its equivalents and the fabric, substantially as and for the purpose specified.

52,609.—Balanced Slide Valve.—Frank H. Richards, Lansingburgh, N. Y.:

First, I claim the arrangement of the two slide valves, F and G, in the same chest, opposite each other, and having the pressure of the steam upon their under sides, as herein described, so that their respective pressures shall be mutually compensatory.

Second, The wedge nut, d, operated as herein described, for adjusting the valves to their respective seats.

52,610.—Piano.—Chandler Robbins, Chicago, Ill.:

First, I claim hanging the sounding box or board to the iron frame, substantially as specified, allowing of the most complete vibration, as is herein set forth.

Second, The combination of the lever, G, the strap, e, and the hammer, I, as and for the purpose herein specified.

Third, The strings, F, made flat, as and for the purpose set forth.

52,611.—Fence.—Smith Sanders, Fort Plain, N. Y.:

First, I claim the combined construction and arrangement of the fence, as herein set forth, the same consisting essentially of the standards made up of the parts, a b c, sections made up of the rails, f f, and cleats or battens, g g, the wire loops, K K, and pins, i, and the tightening bolt, l, the whole operating substantially as and for the purpose specified.

Second, I also claim the particular construction of the skeleton standard composed of the flexible vertical strips, b b, for clamping and holding the sections, the brace boards, c c, bracing part way up the strips and having the grain running with the hypothenuse of the angle, and the base pieces, a a, the whole being arranged as herein described, and used either with or without the stakes, d d, as set forth.

52,612.—Process of Annealing Steel and Other Metals.—Elliot Savage, West Meriden, Conn.:

I claim, First, The method of annealing steel and other metals substantially as hereinbefore described, that is to say, by heating the same in a substance which shall form upon its surface a protecting coating or film, soluble in water or metallic cooling solutions, as set forth.

Second, The use of cyanide of potassium for the purpose of heating steel or other metals in the process of annealing.

Third, The use of metallic solutions for the purpose of cooling steel or other metals in the process of annealing.

Fourth, The employment, in the process of annealing, of cyanide of potassium as the heating medium, in combination with a metallic solution as the cooling medium.

52,613.—Roof.—Michael Simmons, Howardville, Ill.:

I claim the winged sections, AA, constructed and arranged together as and for the purpose herein specified.

52,614.—Eyelet.—Charles D. Smith, Washington, D. C.:

I claim an eyelet which is slit, nicked, or indented, substantially as and for the purpose specified.

52,615.—Roll for Clothes Wringers.—Hamilton E. Smith, Cincinnati, Ohio.:

I claim, First, A clothes-wringer roll composed of sections, C, of rubber, or its equivalent, with interspersed disks. D, of cloth or other fibrous fabric, and rigid washers, B, positive rotation with the shaft, substantially as set forth.

Second, A pair of rolls formed in sections, so arranged as to break joints, in the manner and for the purpose explained.

52,616.—Parallel Rulers.—Uriah Smith, Battle Creek, Mich.:

I claim the slots, e f, or their equivalents, in the parallel arms of the ruler, A B. the cross arms, C D, the points, l m, thumb screw, i, shank, j, and scale, k, all combined and arranged substantially as and for the purpose herein set forth.

52,617.—Connection for Galvanic Battery.—Henry Splitdorf, New York City:

I claim a clamp for connecting the elements of a galvanic battery, said clamp being made of a piece of wire bent so as to form loops at both ends, and provided with screw threads and nuts which serve to tighten up said loops, substantially as and for the purpose set forth.

[This invention relates to an improvement in the clamp which serves to connect the elements of a galvanic battery, and it consists in a clamp made of one piece of wire bent to the desired form, and provided with screws and nuts at both ends, in such a manner that by tightening up said nuts the wire is caused to take a firm hold of the carbon, or zinc or of any other element or elements used, and a clamp is obtained which is cheaply made and readily connected and disconnected.]

52,618.—Lamp-wick Adjuster.—C. C. Stansell, Middleboro, Mass.:

I claim a new mode of raising and adjusting the wicks of lamps, by the use of a metallic, concave, pen-shaped spring-pointed sliding clasp or any similar device, which may be introduced into the wick, or between the wick and inside of the tube for the purpose of compressing and stiffening the wick, thereby rendering it susceptible of easy adjustment.

52,619.—Attaching Shafts to Vehicles.—J. L. Snesserott, Chambersburg, Pa.:

I claim, First, Constructing the shaft box, A, with a step, D, for supporting an india-rubber block, and the recess, a, for holding it in place when used in combination with a block, E, constructed substantially as and for the purpose set forth.

Second, The box, A, having a bar, b, step, D, and india-rubber block, E, arranged as set forth when used in combination with the hooked termination of the shafts, C, substantially as and for the purpose set forth.

52,620.—Shoe Lacing Cutter.—Francis C. Sumner, Stoughton, Mass.:

I claim the above new or improved shoe lacing cutter or machine, as composed of the two knives and the tablet or plate arranged together substantially as described.

I also claim the combination and arrangement of the tablets, the two knives and the screw clamp, the whole being substantially as described.

52,621.—Pole and Thill Coupling.—H. L. Taylor, Fredonia, N. Y.:

First, I claim the combination of the hook, E e, and draft bolt, g, with the follower block, K, india-rubber spring, j, or its self-locking key, o, arranged and operating in the manner and for the purpose shown and described.

Second, I also claim constructing the block, K, with its lips, l l, and cheeks, m m, in combination with the hook, E e, and rubber, j, substantially in the manner and for the purposes described.

Third, I also claim the employment of the lever, S, provided with the hook, t, and spur, u, in combination with the extension, q, and hole, r, for inserting and removing the key, o, substantially as described.

52,622.—Beehive.—Lemuel and Minor Taylor, and Edwin Cox, Jordan, Wis.:

We claim, First, A sealing strip or frame, G, in connection with the band or clamp, I, constructed and applied to the top of the hive to render the same air-tight, substantially as described.

Second, The moth guard, C, constructed in the form described, coated with grease and applied to the bottom of the hive, substantially as set forth.

Third, Constructing the broad chamber, V, and spare honey box, E, of slats and paper. in the manner substantially as described.

52,623.—Organ and Melodeon.—Simeon Taylor, Worcester, Mass.:

I claim, First, The combination with hinged rods, m, of the slotted levers, E, as shown and described, whereby the levers and valves can be readily connected and detached, as set forth.

Second, The combination with frame, D, arms, D' D', and levers, E, of the elevating piece, H, with its cam-like projections, l l, substantially as set forth.

52,624.—Skate.—J. R. Tempest, Philadelphia, Pa.:

I claim the employment of the sliding bolts, C C', in combination with the staples, D D D' D', in the sole plate, A, of the skate, and with the slotted plates, B B', fixed to the bottom of a boot or shoe, the said parts being arranged to operate together as and for the purposes described.

52,625.—Turbine Water Wheel.—John Tyler, West Lebanon, N. H.:

I claim the cylinder, E, encompassing the wheel B, and provided with a rim or flange, a, at its lower end, to fit within the scroll, A, substantially as shown and described, varying simultaneously or by a single manipulation the capacity of the wheel and scroll, as set forth.

I also claim connecting the gate, D, with the cylinder, E, by means of the flange, a, and thus permitting the gate and cylinder to be moved simultaneously and enabling the supply of water to the wheel to be commensurate with the capacity of the wheel and the scroll, substantially as described.

52,626.—Hand Loom.—Clemens Unverzagt, Richmond, Ind.:

I claim, First, The cam block, e, with its collar, f, and the jaws. 4, constructed and operating as and for the purposes described.

Second, The stepping bar, 12, in combination with the jaws, 4, and collar, f.

Third, The compound bevel and spur wheel, 2, with its adjustable arm, 6, as and for the purposes set forth.

Fourth, The combination of the compound wheel, 2, arms, 6 and 7, and ratchet wheel, 8, operating substantially as set forth and described.

Fifth. The elastic band upon the head of the shaft, b, in combination with the set screw, x, and compound wheel, and its connections for operating the take up of the cloth, for the purposes set forth and described.

Sixth, The short levers, s s', in combination with the picker staffs, q q', and the spring, t, arranged and operated as described.

52,627.—Machine for Cutting Bread, Soap and Black Lead.—William B. Vincent, Boston, Mass.:

I claim the combination and arrangement of the cutting wheels, W W' W'' W''', with the sliding trough, C C', made substantially as and for the purpose set forth.

52,628.—Faucet Measure.—Addison Vrooman, Kokomo, Ind.:

I claim the arrangement of the double orifices near the top and bottom of the faucet when the latter is used in combination with the measures, a and b, constructed and operating in the manner described, whereby liquid may be drawn and discharged, measured at the same time, substantially as specified.

I also claim the faucet and measures, a and b, in combination with the vent indicators, c d, constructed, arranged and operating together in the manner described for the purpose specified.

52,629.—Fence.—J. F. Warner, Oskaloosa, Iowa:

I claim the construction and arrangement of the braces and cross-bars applied to the boards or panels of the fence, substantially as herein shown and described.

[This invention relates to a new and improved fence of that class which are constructed of boards or slats arranged horizontally and parallel with each other. The invention consists of supporting the boards of the fence by means of cross braces with notches in said braces, and connecting the panels by lapping the boards clasping the ends between the braces, thereby dispensing with the use of nails, the whole being self-supporting and fastened together by means of pins of wood or other material.]

52,630.—Machine for Rolling Metal.—Hervey Waters, Northbridge, Mass.:

I claim the rolls with their spiral dies and fence or guide, when constructed and operated substantially as described.

Also the carriage and grasping holder. when constructed and operated in combination with rollers, substantially as described, whether the dies upon said rollers be spiral or otherwise.

52,631.—Screw and Bolt.—William Weaver, Nashua, N. H.:

I claim perforating the heads of screws and screw bolts of all kinds that are made with a screw thread and operated by a lever power applied to their heads, substantially as described, and for the purposes set forth.

[The invention consists in perforating the heads of screws and bolts, and driving them by means of a driver inserted in said perforations; thus avoiding the difficulty so often caused by one-half of the screw head breaking off, or the slots becoming so worn that the driver will not take hold of it to drive the screw.]

52,632.—Well Borer.—Samuel H. Whittlesey, Appleton, Wis.:

I claim the burr or borer, D, constructed substantially as above described, with curved cutting edges, I, which spring from the point of the instrument.

Second, I also claim in combination with the burr or borer, D, the hollow cylinder, A, having spiral grooves which are continuations of the grooves between the cutters, I, of the burr or borer, and which terminate at openings, G, at the top of the cylinder, and having also spiral reaming edges, J K L, substantially as above described.

52,633.—Plow.—Joseph Widman and French Mullica, El Paso, Ill.:

We claim the attaching of the plow beam, E, to the axle, A through the medium of the hounds, C C', in combination with the draught pole, F, and bar, K, attached to the plow beam and all arranged to operate in the manner substantially as and for the purpose set forth.

We further claim the arrangement of the cord or chain, I, pulleys, G H, and lever, J, arranged and applied to the plow beam, E, draught pole, F, and bar, K, substantially as and for the purpose specified.

52,634.—Self-adjusting Pulley for Fishing Boats.—William Woodbury, Chelsea, Mass.:

I claim the combination of a block or pulley with a circular bracket under such an arrangement as to allow of the pulley revolving upon its axis, while the latter is free to move within the plane of the bracket, substantially as set forth.

Second, The employment of a block when made with an opening at the top, and provided with a guard in combination with a bracket, as and for the purposes herein set forth.

52,635.—Seed Planter.—James H. Alexander (administrator of the estate of Thomas K. Alexander), Decatur, Ill.:

First, I claim the combination of the oscillating plate, A, having four seed cells in it, with the reciprocating, plate, B, having two delivery holes in it, for the purpose of alternating the cells with the delivery holes, substantially as described.

Second, In combination with an upper oscillating and an under reciprocating plate, the grooves and cam projections on one and the button and stop on the other, so that four oscillations of the upper plate shall produce but two reciprocations of the under plate, substantially as and for the purpose described.

Second, In combination with a four cell oscillating plate, a double-spring cut-off, so that each cell shall pass twice into the hopper, and twice under the cut-off for each and every of its dropping operations, substantially as and for the purpose described.

Fourth, In combination with the spring cut-off and turned lip thereon, the sloping out of the tops of the cells as at E, so that the excess of protruding grains may be swept or brushed back without breaking or injuring them, substantially as set forth.

52,636.—Block Disengaging Hook.—Samuel Brown (assignor to himself and Leon Level), San Francisco, Cal.:

I claim the piece, J, with jaws, I I, and the segments, E E, operating by the slide, F, with recessed arm, G, and lever, L M, or their equivalents, substantially as and for the purposes herein specified as set forth.

52,637.—Hoop Skirt.—John P. Buzzell (assignor to himself and Henry Hemmenway), Clinton, Mass.:

I claim a hoop skirt provided with an opening, a, in its back part, produced by cutting out portions of the hoops, B', whether said opening is left empty or filled with netting or other flexible material, substantially as and for the purpose herein described.

[This invention consists in a hoop skirt provided with an opening in its back part, at about the middle of its hight, said opening being produced by cutting out portions of the four, more or less middle hoops in such a manner that the skirt will readily bend in, and the wearer thereof, in sitting down, has no trouble to adjust the skirt, as the same will adjust itself without difficulty. The opening thus produced may be filled by netting or other flexible material.]

52,638.—Saw Set.—Bennington G. Chase (assignor to himself and Robert T. Lucas), Alexandria, Va.:

I claim the construction of the devices, A B C E H and J, when

© 1866 SCIENTIFIC AMERICAN, INC.

arranged and combined as herein described and for the purposes set forth.

52,639.—Clasp for Skirt Hoops.—George W. Cheesman (assignor to himself and J. W. Osborne), Ansonia, Conn.:

I claim in clasps for skirt hoops, notching their ends, substantially as and for the purpose above set forth.

52,640.—Rendering Apparatus.—Charles J. Everett (assignor to Lockwood and Everett), New York City:

I claim consuming the noxious gases, steam or vapors as they issue from the apparatus while in operation, or after the fire has been withdrawn, therefrom by the use of a separate consuming furnace connected to, or in communication therewith.

Second, The use of a superheater in combination with said consuming furnace and in connection with the apparatus for the purpose specified.

Third, Passing the superheated steam, gas or vapor through a coil of pipe placed in the digester for the purpose of raising the temperature in the digester, and to dry or crisp the scrap as set forth.

Fourth, Carrying the heat directly from the furnace through a coil of pipe placed in the digester, and so arranged as to discharge in the chimney, making said coil a flue from the furnace to the chimney, for the purpose of raising the temperature of the digester, and to crisp or dry the scrap as set forth.

Fifth, Avoiding the condensation of the noxious vapors and gases against the uncovered part of the digester, by carrying the steam and water jacket all the way around it so as to entirely envelope the digester as set forth.

Sixth, The use of a deodorizer filled with chloride of lime or its chemical equivalent for this purpose, in combination with a digester for rendering and refining lard, tallow and other fatty or oleaginous matter for the purpose of deodorizing and disinfecting the noxious gases as they issue therefrom.

53,641.—Stamping Head.—P. W. Yates (assignor to himself and R. D. Frazer), Chicago, Illinois:

I claim the compound hard and soft metal shoe, A B C, constructed and produced substantially in the manner described.

Second, Constructing the stem, A, with a flange, B, which has intersecting dove-tail grooves in its lower face, so that the metal which forms the part, C, of the shoe shall be united to it by the acting said part, C, substantially as described.

Third, The intersecting dove-tail grooves formed in the underside of the soft metal stem, A, of a compound hard and soft metal shoe, substantially as described.

52,642.—Well-boring Apparatus.—S. J. Goncher (assignor to Wm. Foreman), Philadelphia, Pa.:

I claim the shaft, c, with its permanent pulley, I, and loose pulleys, ', and J, combined with the driving shaft, H, adjustable shaft, c, its pulleys, J', the drum, C, and walking beam, F, all substantially as and for the purpose described.

52,643.—Darning Spool.—Joseph H. Greenleaf (assignor to John M. Marlin, and Geo. H. Snow), New Haven, Conn.:

I claim the darning spool above described as a new article of manufacture.

(The object of this invention is to produce an article which will serve to hold, as on a spool, several varieties of darning yarn and whose ends shall serve to distend the parts of a stocking to be mended or darned.)

52,644.—Piston Packing.—Thomas J. Jones, Summit, New Jersey, assignor to C. J. Eames, New York City:

I claim as an improvement in springs, for piston packing, the double, M, shaped spring closed in front, and open at the back in the manner herein specified and represented.

52,645.—Lacing Device.—E. C. C. Kellogg, Hartford, Conn., assignor to himself S. F. Bennett, and D. H. Burrill, Little Falls, N. Y.:

I claim the punch, k, knife blade, h, needle, m, and awl, n, arranged with reference to each other upon the pivoted levers, A B, substantially as set forth for the purpose specified.

52,646.—Sewing Machine Hemmer.—George C. Overhiser, Ionia, Mich., assignor to himself and Jacob C. Robie, Binghamton, N. Y. Antedated Feb. 5, 1860:

I claim the combination of the hemmer, N, sliding gage, K M, clamp, L, pressure spring, H, smoothing spring, I, hinge l, d, bar, G, and frame, A, arranged and operating in the manner and for the purpose set forth herein.

52,647.—Method of Treating Sheet Iron Plates.—Charles H. Perkins (assignor to the Perkins Sheet Iron Co.), Providence, R. I.:

I claim giving to common sheet iron, the luster finish and color of Russia sheet iron, by the process, substantially as described.

52,648.—Hot Air Furnace.—Jacob H. Schwein, Cincinnati, Ohio, assignor to himself and Christian Rummel:

I claim the fire pot, A B C, slab, D, smoke passages, E F G, and caliducts or ventilating passages, K L M, the whole being arranged and operating substantially as described.

52,649.—Hinge.—Samuel Selden (assignor to John C. Selden,) Fairview Township, Pa.:

I claim the movable pintle constructed with the fixed washer or enlarged center, q, in combination with the two leaves of a hinge constructed substantially as described.

52,650.—Preservatory.—Addison Smith, Perrysburg, Ohio, assignor to himself David M. Mifford, and Giles Boalt, Norwalk, Ohio:

I claim, First, A receptacle compartment or box for fruit or other edibles having two orifices or series of orifices communicating respectively with opposite ends of a deoxygenating chamber or circuit outside of said receptacle and provided with a forced circulation, substantially as and for the purpose set forth.

Second, In the described communication with one another, the following elements, to wit, the closed preserving chamber, A, whether subdivided or otherwise, and the closed combustion chamber or circuit, D.

Third, In the described communication with one another, the following elements, to wit, the closed preserving chamber, A, the combustion circuit, D, and the mechanical circulation, G.'"

Fourth, In the described communication with one another, the following elements to wit, the closed preserving chamber, A, with the deoxygenating chamber, G'.

Fifth, In the described communication with one another, the following elements, to wit, the closed preserving chamber, A, and the desiccating chamber, G."

Sixth, The closed preserving chamber, A, communicating with the described deoxygenating and desiccating circuit, G, provided with a forced circulation, the whole being combined and operating substantially as and for the purpose set forth.

Seventh, A close preserving chamber having the meandering ventilating ducts, L l l' l", in which a circulation and deoxygenation is maintained by alternative connection with the combustion circuit, D, and the deoxygenating circuit, G, substantially as herein set forth and described.

Eighth, A closed preserving chamber in which a circulation, deoxygenation and desiccation of the air is maintained by the use of a desiccating chamber, G", in combination with a deoxygenating chamber, G' or D', and a forcing apparatus, G.'"

Ninth, The series of closed preserving chambers, provided with the meandering ducts, L, l l', having a forced circulation and communicating with a closed deoxygenating chamber, G', and a closed desiccating chamber, G", substantially as set forth.

52,651.—Gang Plow.—John E. Travis (assignor to himself and Elon Francisco), Grenville, Ill.:

I claim, First, The sliding bar, C, when used in connection with the axle, B, and bolster, D, and regulating bolts, a a', as and for the purpose set forth.

Second, I claim the hinged braces, H H, the levers, H" H", and posts, F' F', for the purpose of attaching the plow frame of gang plows to the bolster thereof, when such parts are constructed and employed as described and set forth.

52,652.—Buckle.—Julius Waterman, New York City, assignor to himself and Joseph Mayer, Brooklyn, N. Y.:

I claim the buckle for shirt bands, etc., formed of two rectangular loops, one over the other, as specified.

52,653.—Machine for Determining the Load of Car Axles.—J. H. Ehrhardt, Dresden, Saxony:

I claim, First, The supporter, A B, with lip, a, and leg, d, in combination with the scale beam, C, and steelyard, D, or its equivalent constructed and operating substantially as and for the purpose described.

Second, The adjustable wedge, i, in combination with the slides, f, bearings, g, scale beam, C, and supporter, A B, constructed and operating substantially as and for the purpose set forth.

Third, The index, m, in combination with the steelyard, D, supporter, A B, and scale beam, C, constructed and operating substantially as and for the purpose described.

[This invention relates to an apparatus which is intended to balance the weight of a locomotive, tender or railroad car, so as to bring an equal pressure to bear on each of the wheels.]

52,654.—Breech-loading Fire-arm.—Alexander Henry, Edinburgh, Scotland:

I claim, First, The construction of the curved face of the extractor with a dovetail and pin for fixing it to the extractor bar, substantially as hereinbefore described and shown.

Second, The employment of a lever for actuating the movable bolt for locking the barrel in combination with the hammer under the arrangement hereinbefore shown and described, so as to prevent the barrel from being unbolted until the hammer shall have been moved to half-cock and to secure the complete locking of the barrel before the piece can be discharged, substantially as set forth.

52,655.—Process for Tanning Hides and Skins.—Barthelemy Picard, Paris, France:

I claim the process of tanning hides and skins by the employment of essence of turpentine with sumac, catechu, or other vegetable or mineral coloring essence, in combination with the movement of the hides or skins in a fulling tun or under a fulling hammer, substantially as and for the purposes herein set forth.

52,656.—Manufacture of Iron.—Anton K. Kerpely, Oravitza, Hungary, assignor to A. L. Fleury, New York City:

I claim freeing pig iron from sulphur, phosphorus, arsenic, copper and zinc, by blowing chlorine salts with a blast of air into the melting chamber of a blast furnace, into a cupola furnace or into a Bessemer smelting pot, substantially as herein specified.

52,451.—(Heretofore Suspended.)—Steam Engine.—Edvart Lavoradl, New York City:

First, I claim the frame, A, constructed with a hollow column, f, for supporting the cylinder and attached to the boiler and the hull of the vessel, substantially as herein specified.

Second, I claim the combination and arrangement of the supporting column, the single cylinder trunnion, the valve disks, g and p, spring, r, and nut, s, substantially as and for the purpose herein set forth.

REISSUES.

2,168.—Machine for Cutting Splints.—Jonathan C. Brown, Brooklyn, N. Y. Patented June 21, 1864. Reissued Sept. 12, 1864:

I claim cutting forms from wood in the manner described, when the knives on the revolving cylinder are set at different angles as and for the purpose set forth.

I also claim combining the knives, rotating and stationary, in one frame, as herein set forth, so as to cause the two cuts that are at right angles to exactly meet, so as to cut the form off perfectly, and at the same time avoid scoring the wood deeper than the part removed, all as above specified.

2,169.—Making Hollow Articles of India-rubber.—Charles Goodyear, Jr., New York City, executor of estate of Charles Goodyear, deceased. Patented April 25, 1848. Extended 7 years:

What is claimed as a new article of manufacture and trade are hollow, vulcanized india-rubber articles, the external shape of which is produced by internal pressure derived from an elastic fluid.

2,170.—Making Hollow Articles of India-rubber.—Charles Goodyear, Jr., New York City, executor of estate of Charles Goodyear, deceased. Patented April 25, 1848. Extended 7 years:

I claim the above-described process of making hollow spheres, various hollow toys or other hollow articles of caoutchouc, the same consisting in the employment of a mold, and heat and air or its equivalent, substantially in the manner and under the circumstances above set forth.

2,171.—Machine for Making Kettles.—Hiram W. Hayden, Waterbury, Conn. Patented Dec. 16, 1851. Extended 7 years:

First, I claim the combination of mechanism constructed and arranged substantially as specified, for making kettles and similar articles, in substantially the manner set forth.

Second, The construction of the mandrel, f3, part of which is cylindrical and part fitted with a short screw, 13, to take the screw of the hand wheel, f2, so that great pressure may be made at the point desired, while at the same time the mandrel can be easily and quickly moved through a long distance for the purposes and as described and shown.

2,172.—Horse Shoe.—J. Wilson Hodges and P. De Murquionds, Baltimore, Md., assignees of J. Wilson Hodges. Patented July 4, 1865:

I claim the attachable and removable roughing bar, C, provided with calks and countersunk or let into the face of the shoe, substantially as described.

I claim the blank bar, E', adapted to occupy the groove, B, in the absence of the roughing bar, and secured in a similar manner within the groove.

2,173.—Wood-bending Machine.—John Philip Leizelter, Lancaster, Pa. Patented Feb. 21, 1865:

First, I claim the winged or framed side levers, E, held by a pivot or hinge affixed by a bolt or plate on each side of the drum, substantially in the manner shown and specified.

Second, I also claim the binding straps, M, when they are firmly united to a slotted hook, affixed to each end of the same, in the manner and for the purpose specified.

2,174.—Roller for Wringers.—Joseph F. Pond, Cleveland, Ohio. Patented April 5, 1864:

I claim the application of canvas, cloth, or other similar material, for the purpose of covering, repairing, and protecting elastic india-rubber or compound rollers, and to prevent the shaft getting loose or turning in the roll, as and for the purpose specified.

2,175.—Lantern.—Wm. Westlake, Chicago, Ill. Patented Sept. 26, 1865:

First, I claim the band, d, in combination with the band, b, for the purpose set forth.

Second, The band, l, in combination with the band or upright portion of the bottom, e, for keeping the bottom of the globe in place, as herein described.

Third, The means described, or its equivalent, for securing the ends of the upright bars to the horizontal bars of the guard.

DESIGNS.

2,263.—Door Lock.—John H. Barnes, Brooklyn, N. Y.

2,264.—Piano Stool.—Charles Zeuner (assignor to M. Greenwood & Co.), Cincinnati, Ohio.

RECEIPTS.—When money is paid at the office for subscriptions, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a *bona-fide* acknowledgment of our reception of their funds.

Notes and Queries

S. D. R., of Tenn.—Sugar is obtained from sorghum by expressing and evaporating the juice. Full accounts of the process, with illustrations of the apparatus, have appeared in our back volumes. Sirup is obtained without difficulty, but most farmers, working on a small scale, fail to obtain granulated sugar

A. F. C., of Ill.—In this country breast wheels have long since superseded overshots, and now turbines are generally taking the place of breast wheels. The highest power has been obtained from Stevenson's, but others much cheaper are said to give very nearly as good results.

W. M., of Conn.—In civil life the day begins at midnight, and is divided into two periods of 12 hours each. The first hour of the day is from midnight to 1 o'clock in the morning. In astronomy the day begins at noon, and the hours are numbered from 1 to 24.

C. W.—Several patents have been taken out for making fuel of coal dust. The general plan is to mix with it an adhesive substance and then submit to pressure. Some of these compounds have been advertised or described in the SCIENTIFIC AMERICAN.

C. O. G.—We have already stated that the Cutting patent covered the use of bromide of potassium in collodion, and that the use of all other forms of bromine is free to the public.

O. S.—Wind mills are extensively and profitably used on shops, for various purposes.

PATENT OFFICE.

PATENTS GRANTED FOR SEVENTEEN YEARS.

MUNN & COMPANY.

In connection with the publication of the SCIENTIFIC AMERICAN have acted as Solicitors and Attorneys for procuring "Letters Patent" for *new inventions* in the United States and in all foreign countries during the past *twenty years*. Statistics show that nearly ONE-HALF of all the applications made for patents in the United States are solicited through this office; while nearly THREE-FOURTHS of all the patents taken in foreign countries are procured through the same source. It is almost needless to add that, after so many years' experience in preparing specifications and drawings for the United States Patent Office, the proprietors of the SCIENTIFIC AMERICAN are perfectly conversant with the preparation of applications in the best manner, and the transaction of all business before the Patent Office.

Judge Mason, formerly Commissioner of Patents, says, in a letter addressed to us:—"In all your intercourse with the office, I always observed a marked degree of promptness, *skill*, and fidelity to the interests of your clients."

Ex-Commissioner Holt says:—"Your business was *very large*, and you sustained and justly deserved the reputation of *marked ability* and *uncompromising fidelity* to the interests of your clients."

Ex-Commissioner Bishop says:—"I have ever found you faithful and devoted to the interests of your clients, as well as *eminently qualified* to perform the duties of Patent Attorneys."

EXAMINATIONS.—If an inventor wishes our opinion in regard to the probable novelty of his invention, he has only to send us pencil or pen-and-ink sketch of it, together with a description its operation. For an opinion, without examination at the Patent Office, we make no charge, but if a

PRELIMINARY EXAMINATION AT THE PATENT OFFICE

is desired, we charge the small fee of $5. This examination involves a personal search at the Patent Office of all models belonging to the class, and will generally determine the question of novelty in advance of an application for a patent. Up to this time we have conducted over ELEVEN THOUSAND Preliminary Examinations, thus showing a more intimate knowledge of inventions at the Patent Office than can be possessed by any other person or firm.

If an inventor decides to apply for a patent, he should proceed at once to send us by express, charges prepaid, a model not over one foot in size, and substantially made. He should also attach his name and residence to the model.

PATENTS ARE GRANTED FOR SEVENTEEN YEARS, the following being a schedule of fees:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design.	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Reissue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
On filing application for Design (seven years)	$15
On filing application for Design (fourteen years)	$30

In addition to which there are some small revenue-stamp taxes Canadians have to pay $500.

FOREIGN PATENTS.—Messrs. MUNN & CO. have had more experience than any other solicitors in this country in procuring foreign patents, and have old established agents in London, Paris, Brussels, Berlin, Vienna, and other large cities. Foreign business should never be intrusted to other than experienced agents.

Messrs. MUNN & CO. give special attention to the preparation of Caveats, and to the prosecution of the EXTENSION OF PATENTS, Reissue of DEFECTIVE PATENTS, REJECTED CLAIMS, INTERFERENCES, and DISCLAIMERS. They also prepare ASSIGNMENTS, LICENSES, AGREEMENTS, and CONTRACTS, in reference to Patents and will advise patentees when their rights are infringed in reference to bringing suits against INFRINGERS. In connection with a Patent Lawyer of eminent ability, they prepare and conduct cases in the United States Courts. Indeed, there is no branch of Patent business which MUNN & CO. are not prepared to undertake.

If an inventor wishes to apply for a patent, all he has to do is to write to us freely for advice and instruction, and he will receive prompt attention. If his invention contains any Patentable features, he can depend upon getting his Letters Patent. All communications considered confidential. Send models and fees addressed to

MUNN & CO.,
No. 37 Park Row.

© 1866 SCIENTIFIC AMERICAN, INC.

NEW RATES OF ADVERTISING.

FORTY CENTS per line for each and every insertion, payable in advance. To enable all to understand how to calculate the amount they must send when they wish advertisements published we will explain that eight words average one line. Engravings will not be admitted into our advertising columns, and, as heretofore, the publishers reserve to themselves the right to reject any advertisement they may deem objectionable.

CHARLES A. SEELY (LATE PROF. OF CHEMISTRY in the N. Y Medical College), Consulting and Analytical Chemist. 246 Canal st., N. Y. Advice, instruction, investigations, etc. Analyses of metals, minerals, commercial products, etc. 1*

MACHINERY.—WE ARE MANUFACTURING AND have constantly on hand Portable and Stationary Steam Engines, Machinists' Tools of all kinds, also Saw-mills and Woodworking Machinery, etc., at Paterson, N. J. Office and warehouse, No. 4 Dey st., New York. [9 4] TODD & RAFFERTY.

TWO UPRIGHT HYDRAULIC PRESSES, 12-INCH Cylinder, with two pumps each, for sale low.
1* F. W. KRAUSE, Chicago, Ill.

CHAS. H. JONES, MANUFACTURER OF STEEL Sinkers and Platens of every description, for Knitting Machines. The best material and workmanship guaranteed. Plainville, Conn. 9 3*

JENKINS & TONGUE, EDGE TOOL MAKERS, are prepared, with an experience of twenty years, to manufacture large cutting instruments and tools requiring a superior edge and temper. Dyewood Knives, Leather Splitting Knives, Paper Knives, Shear Blades, Boxmakers' Shears, Knives for Planing Machines, Molding, Spoke, and Cork Machines, etc., etc., made to order and warranted. Nos. 33 and 35 Richmond street, Philadelphia.

"Having used for some time past, in chipping dyewood, large knives made by JENKINS & TONGUE, it gives us pleasure to say that they have been uniformly satisfactory, and superior in quality to any knives we have been able to procure in a fifteen years' experience." BROWNING & BROTHERS,
1* Nos. 42 and 44 N. Front st., Phila.

SUBMARINE DIVING APPARATUS.—NEW MACHINERY, Etc., including the best submarine lantern used, furnished and fitted up for any kind of work, using steam or hand power, by an experienced submarine engineer. Also operations of any description requiring the best of divers, apparatus, and experience, performed at short notice. Parties wishing to contract for apparatus or work are invited to correspond.
GEO. W. FULLER,
9 3* Consulting Submarine Engineer and Diver, Chelsea, Mass.

HEAVY PARALLEL SWIVEL VISES.

Width of jaw,	5 inches,	6¼ inches,	8 inches.
Weight of vsie,	80 lbs.,	130 lbs.,	167 lbs.
Size of screw,	1¼,	1½,	1¾,
Size of wrought bar,	2x1¼,	2½x1¼,	3x1¼,
Will open	8 inches,	9 inches,	12 inches.
Price,	$20,	$25,	$30.

These vises are made of cast iron. The parallel bar is of wrought iron; jaws faced with steel. Purchasers will find them a good and substantial article. CHARLES MERRILL & SONS,
9 4 No. 556 Grand street, New York.

MERCHANTS SHOULD HAVE PURINGTON'S Patent Alarm Drawer. It has thirty (30) changes, and can be altered every day in the month. All orders must be addressed to
9 13* A. S. TURNER.

CHOICE PEAR TREES FOR SALE AT A SACRIFICE.—The subscriber, desirous of thinning out his extensive pear orchards, offers for sale at one half the usual prices, over two thousand choice Dwarf and Standard Pear Trees, of the Bartlett, Louise Bonne de Jersey, and Duchesse d'Angouleme varieties, from three to seven years old, and in bearing condition. Parties desirous of purchasing can give the trees a personal inspection. All orders by mail will be promptly attended to. WILLIAM Y. BEACH,
9 tf g Wallingford, New Haven Co., Conn.

100 PER CENT IN TIME. 75 PER CENT LABOR, 50 per cent money saved by using Talpey's Patent Self-feeding Hand Sawing Maching and Combination Scroll Saw. Send for circular to WM H. HOAG,
1* Post-office Box 4,245, New York.

NO MANUFACTURING ESTABLISHMENT SHOULD be without a Belt Stretcher when they can be bought at a low price. For cut and descriptive circular and price address
9 2 SEYMOUR ROGERS, Pittsburgh, Pa.

TRY IT!—MOORE'S RURAL NEW YORKER, THE great Agricultural, Horticultural, Literary, and Family Newspaper. Ably conducted, finely printed and illustrated—(over Forty Engravings in the four numbers for January.) Adapted to the whole Continent—both Town and country. Largest circulating journal of its class in the world, and thousands added every week—its cash receipts for 12 days ending Jan. 6, 1866, being $33,859 51! Send $3 for a year—or, if you wish to know more about it first, the 13 numbers of this quarter (January to April) will be sent, on trial, for only 50 cents. Try the RURAL, and see if it is not the best. Address D. D. T. MOORE, Rochester, N. Y.

FOR SALE—A 12-HORSE STEAM BOILER—VERTICAL water tubes: also a 2-horse Locomotive Boiler; both made in the best manner and nearly new. Apply at CLINTON FOUNDERY,
1* No. 239 Cherry street, New York City.

TURNERS' TOOLS.—THE WRITER OF THE ARTICLES on Foot Lathes recently published in the SCIENTIFIC AMERICAN, having facilities for manufacturing, will furnish a tool as a substitute for the slide rest which will bore a true hole of any size, face off any piece held in the chuck, or turn a straight rod, at one fourth the cost of the rest. The price for the latter, for the smallest size, is $40. I sell my tools for $10 each. They are made of the best cast steel, iron, and brass, with superior workmanship, and are warranted to do good work. Holes of any taper, either inside or out, can be made with this tool, and it can be fixed in the common tool rest so that the latter need not be removed. Amateurs, mechanical dentists, machinists, and all others, will find this a handy appendage. Address, inclosing price.
EGBERT P. WATSON, Box 773, New York.
Centers to take 12 inches, with index plate, $50

THOMAS BARRACLOUGH & CO.,
MANCHESTER, ENGLAND,
Makers and Patentees of
HECKLING, SPINNING, LAYING,
And other Machines, for the Manufacture of
ROPE, LINES, CORD, TWINE,
9 26 FISHING LINES, SPUN YARN, NETS, ETC.

IMPROVED STATIONARY AND PORTABLE STEAM Engines and Boilers, also Saw Mills, Cotton and Hay Presses, Corn and Flour Mills, on hand and in process of construction.
Marine Engines, Iron Steamers, Light-draft River Boats, Barges, Iron Bridges, Tanks, and general iron work constructed to order.
Address T. F. ROWLAND,
9 26 Continental Works, Greenpoint, Brooklyn, N. Y.

WANTED—ACTIVE MEN, TO SELL PURINGTON'S Patent Alarm Drawer. Great inducements to good business men. Address A. S. TURNER, Willimantic, Conn. 9 13*

BUY THE BEST—SMITH'S GREEN MOUNTAIN Shingle Machine. Address
5 8* F. KRUM & CO., Box E, Albany, N. Y.

BUILDING AND ARCHITECTURE.

THE RUDIMENTS OF ARCHITECTURE AND BUILDING. For the use of Architects, Builders, Draughtsmen, Machinists, Engineers, and Mechanics. Edited by John Bullock, author of "The American Cottage Builder." Illustrated by 250 Engravings. In one volume, 8vo. $3 50. By mail free of postage.

CONTENTS.

BOOK I. THE ORDERS.—Doric Order—Modern Doric—Tuscan Order—Ionic Order—Ionic Antæ—Ionic Entablature—Roman and Modern Doric—Entablature—Corinthian Order—Composite Order—Columniation—Intercolumniation.

BOOK II. Sketches of the History and Description of the Styles of Architecture of Various Countries from the Earliest to the Present Time. CHAP. I. Architecture of Various Countries—Nineveh, Babylon and Egypt. II. Grecian Architecture. III. Roman Architecture. IV. Byzantine and Romanesque. V. The Architecture of Germany, France, and Normandy. VI. Syrian, Persian, and Persepolitan Architecture. VII. The Ancient Architecture of India. VIII. Chinese Architecture. IX. Arabian, Saracenic, or Moorish Architecture. X. Druidical, Celtic and Anglo-Roman Architecture. XI. Architecture of England.

BOOK III. CHAP. I. Definition of Architecture—Its Necessity, Uses, and Requirements. II. Ocular and Formal Beauty—First Generalization Thereon—Unity and Variety—Graduation and Contrast. III. Different Kinds of Beauty, of Sublimity, and of Picturesqueness—their Characteristics. IV. Imitation of Nature and of Models—False Imitatirn—Constructive Truth—Constructive Unity—Three Systems thereof. V. Application of the foregoing Principles to Trabeated or Beamed Building by the Grecian Architects. VI. Application of the same Principles to Compressile Building by the Mediæval Architects—Of Arch or Vault Work as the fundamental principle of the Gothic system—On the General Plans—Post-Gothic Architecture—Concluding Remarks—Ancient Monuments of Greece—Glossary.

RUDIMENTS OF THE ART OF BUILDING. SECTION I. General Principles of Construction. Foundations—Natural Foundations—Artificial Foundations—Foundations in Water—Foundations formed wholly of Piles—Solid Foundations simply laid on the surface of the Ground—Pierre Perdue—Coursed Masonry—Beton—Caissons—Solid Foundations laid in Cofferdams—Beton—Pile-driving—Cofferdams—Retaining Walls—Amount and Direction of the Thrust—Calculation of Minimum Thrust—Resistance of the Wall—Counterforts—Breast Walls—Arches—Brick Arches—Skew Arches—Centering—Abutments—Wing Walls—Vaulting—Masonry; Brickwork; Bond—Uniformity of Construction—Bond—Distribution of the Load—Partitions—Floors—Roofing—Trussed Roofs exerting no Side Thrust on the Walls—Roofs on the Principle of the Arch—Gothic Roofs—Roof Coverings—Tiles—Metallic Coverings—Supply of Water—Warming and Ventilation—Methods of Warming independently of Ventilation—Methods of Warming combined with Ventilation. II. Materials used in Building. Lumber—Decay of Lumber—Prevention of Decay—Limes and Cement, Mortar, etc.—Pure Limes—Water Limes—Dorking Lime—Blue Lias Limes—Water Cements—Concrete and Beton—Metals—Iron—Cast Iron—Lead—Cast Lead—Copper—Zinc—Brass—Bronze—Bell Metal—Stone—Slate—Sandstones—Limestones—Slate—Glass—Bricks and Tiles. III. Strength of Materials. Resistance to Compression—Resistance to Tension—Strength of Beams—Cross Strain—Mechanical Effect of a given Load under varying Circumstances—Resistance of the Beam—Trussed Timber Beams—Strength of Story-posts and Cast-iron Pillars. IV. Use of Materials. Excavator—Bricklayer—Mason—Carpenter—Joiner—Slater—Table of Sizes of Roofing Slates—Slates—Plasterer—Memoranda—Smith and Ironfounder—Plumber—Table of the Weight of Lead Pipes per yard—Zinc Worker—Glazier—Painter, Paperhanger, and Decorator—Drainage—Paints. V. Making Drawings, Specifications, Estimates, and Contracts. Plan of Site—Levels—Working Drawings—Block Plans—General Drawings—Detailed Drawings—Specification—Conditions of Contract—The Description of the Works—Bills of Quantities.

APPENDIX.—Woods of North America—Weight of Stone—Weight of Timber—Wages—Weight of Earth—Tiling—Mortar.

The above or any other of my PRACTICAL AND SCIENTIFIC BOOKS sent by mail, free of postage, at the publication prices. My new catalogue sent free of postage to any one who will favor me with his address. HENRY CAREY BAIRD.
Industrial Publisher, 406 Walnut st., Philadelphia.

MECHANICAL PHOTOGRAPHY.—ROCKWOOD & CO., No. 839 Broadway, were awarded a medal (the highest premium) for the best photographs of machinery and copies of mechanical drawings, maps, etc., by the last Fair of the American Institute. This department is in immediate charge of one of the firm. Patents can be copied at small cost, and duplicates furnished to assignees or agents. 1*

TO SOAP MANUFACTURERS.—PROF. H. DUSSAUCE, Chemist, is ready to furnish Plans of Factories, Drawings of Apparatus, Recipes to prepare every kind of Lyes and the following soaps:—Castile, Hard Soft, Rosin, Family, Fancy, Wax, Palm and Coco, Toilet Powder, Transparent, Silicated, Etc.
Analyses and Assays of Alkalies, Lyes, Limes, Acids, Greases, Oils, Soaps, Etc. Address
1* PROF. H. DUSSAUCE, New Lebanon, N. Y.

IMPORTANT TO MINERS, MILL MEN, AND PAINT MANUFACTURERS.—Roasting and Desulphurizing of Gold Ore successfully done away with.
I am prepared to run with Fire Assay, showing nearly the same results. Will run fifty pounds and upward free of charge, giving parties the bullion.
I also have machinery and furnaces for working Silver Ores, and machinery for grinding Paint Ore.
Machinery in operation daily from 1 to 4 P. M., at 57 Lewis street.
9 tf M. B. DODGE.

TO MANUFACTURERS.—FOR SALE OR LEASE—The right to make and sell the best Step Ladder in the United States. In the home territory hundreds are being made and sold.
9 2* W. E. BOND, Cleveland, Ohio.

VALUABLE SCIENTIFIC WORKS.—BOURNE ON the Steam Engine (Artisan Club edition). 1 vol. 4to., cloth..$21
Cresy's Encyclopedia of Civil Engineering, Etc. 1 vol. 8vo., cloth. 21
Francis on Strength of Cast-iron Pillars. 1 vol. 8vo., cloth..... 2
Isherwood's Experimental Researches in Steam. 2 vols 4to., half morocco 25
Rankine's Civil Engineering. 1 vol. 8vo., cloth 8
Russell's Great Work on Naval Architecture. 3 vols. imp. folio..450
For sale by D. VAN NOSTRAND,
No. 192 Broadway.
*** Send for circulars.

TWO VALUABLE PATENTS FOR SALE—DATED June 27, 1865, and Jan. 23, 1866.—Rubber Boots and Shoes made under these patents are worn without any other shoe, do not draw or sweat the feet, are impervious alike to cold and wet, are like leather in appearance, and will wear longer. Leather shoes are rendered warm and water proof. I will either sell, or make arrangements with manufacturers. Parties interested are invited to investigate. Address EDWIN CHESTERMAN, Roxbury, Mass. 9 3*

MANUFACTURE OF VINEGAR.—PROFESSOR H. DUSSAUCE, Chemist, is ready to furnish processes to manufacture Vinegar by the slow and quick methods, and by distillation of wood; preparation of the wash, with and without alcohol; preparation of the grains; purification of vinegar; fabrication of acetic acid; processes to try vinegars.
For further information address
1* New Lebanon, New York.

NEW EDITIONS!—THE PICTORIAL DOUBLE NO.'S for Jan. and Feb., PHRENOLOGICAL JOURNAL, with PHYSIOGNOMY, ETHNOLOGY, PHYSIOLOGY, and PSYCHOLOGY, now ready, 20 cents each, or $2 a year. Address
8 2 FOWLER & WELLS, 389 Broadway, New York.

H. N. WINANS, NO. 11 WALL STREET, NEW York, has 6,000 proofs of the efficiency and economy in using his INCRUSTATION POWDER. Guaranteed anywhere. 8 2*

STEAM ENGINES FOR SALE.—ONE VERTICAL Inverted, 8-inch cylinder, 12-inch stroke. One that may be used vertical, horizontal, or inclined. One Dimphel Blower, 48x22 inches.
F. W. BACON & CO, No. 84 John street, N. Y.

SPRINGS—POLISHED AND UNPOLISHED—MANUFACTURED by ELI TERRY, Terryville, Conn. 7 8*

COAL $2 PER TUN.—THE WHOLE UNION, OR State, County, or City Rights for sale. A Patent Process of Aggregating Coal Dust of Waste Coal into lumps of any size, together with machinery which will produce 100 tuns daily, costing $2 per tun, and worth more than new coal. Address H. D. S., Box 773, Post-office, New York. 8 2*

CIRCULAR SAWS,
WITH EMERSON'S PATENT MOVABLE TEETH,
Require less power, less skill, less files—saw smoother and better, cut less kerf—the saw always retains its original size. Send for descriptive pamphlet, containing information of value to all parties interested in lumber and sawing of any description.
Address AMERICAN SAW COMPANY, No. 80 Beekman street, N. Y., or Factory, Trenton, N. J. 8 4*

FOR SALE—THE RIGHT FOR NEW ENGLAND and New York or a recent and valuable Patent.
8 2* S. C. EATON & CO., 1,114 Market st., Philadelphia, Pa

SAW GUMMERS, UPSETS, SWEDGES AND OTHER Saw Tools. Send for a Circular.
8 13 G. A. PRESCOTT, Sandy Hill, N. Y.

25 HORSE-POWER ENGINE AND BOILER IN GOOD Running Order for sale. Inquire of E. L. PEROT & CO., 69 Pearl street, up stairs. 8 3*

COPPER PLATING OF CAST IRON.—A NEW, SIMPLE mode of copper-plating cast iron without galvanic battery, for sale by A. SCHELLER, 36 Beekman street, New York.
8 2*

YELLOW PINE LUMBER.—THE OGLETHORPE MILLS, Savannah, Ga., will manufacture Georgia Yellow Pine Lumber, for Mining Companies, Factories, Ship Builders, Etc., Etc. Address the agents, Messrs. WINBORN LAWTON & CO., Savannah, Ga., or Messrs. JOHN H. LIDGERWOOD & CO., 175 Pearl street, New York. 8 12

WATER WHEELS.—THE HELICAL JONVAL TURBINE, for first-class mills where great economy of water is desired, made by J. E. STEVENSON, Hydraulic Engineer, 40 Dey street, New York. 8 6*

PATTERN LETTERS AND FIGURES (METALLIC) —For Founderymen, Machinists, Pattern Makers, and Inventors, all sizes, at wholesale and retail, by
7 9* KNIGHT BROS., Seneca Falls, N. Y.

WOOD-WORKING MACHINERY.—WE ARE BUILDING Woodworth Planing, Tonguing, and Grooving Machines, from new patterns of the most approved styles and best workmanship; also furnish all kinds of Wood-working Machinery at manufacturers' prices. WITHERBY, RUGG & RICHARDSON,
7 9* Corner Union and Central sts., Worcester, Mass.

THE SAFETY BRIDLE AND LINES PREVENT ALL accidents by horses. Cost no more than the old style, and pay larger profit than any other business to sell rights. See engraving, No. 5, present volume. State and County Rights for sale. Send for a circular to S. B. HARTMAN,
6 12* Box 47, Millersville, Lancaster Co., Pa.

MOSES G. WILDER & CO., WEST MERIDEN, Conn., have experience in, and give careful attention to Designing, Arranging, and Manufacturing all kinds of nice Machinery and Automatic Tools, Die Sinking, light Jobbing, Etc., to order.
Manufacture Wilder's Patent Power Punching Press, Wilder's Patent Universal Milling Machine, and Newell's "Centering and Squaring" Lathe Attachment.
Parties wishing to contract for any machinery or tools requiring good workmanship are invited to correspond.
Meriden, Conn., Jan. 27, 1866. 6 4*

WANTED—AGENTS—$150 to $200 PER MONTH, TO sell the celebrated COMMON SENSE FAMILY SEWING MACHINE. Price $18. The cheapest Family Sewing Machine in the United States. Every machine warranted for three years. Send for descriptive circulars. Address SECOMB & Co., Chicago, Ill., or Cleveland, Ohio. 6 12*

CONNECTICUT IRON WORKS,
Manufacturers of
Portable and Stationary Steam Engines, Boilers, Steam Pumps, Etc.
Also,
Evans & Burges' Patent Water Front Forge.
6 12* No. 157 Temple street, New Haven, Conn.

STEAM GAGES—BATES'S PATENT—GOVERNMENT and City Standards.—The cheapest and best steam gages ever offered in this market. Also Water Gages, Marine Clocks, Registers, Etc. Call and Examine, or send for circular before purchasing elsewhere. KEEN BROTHERS, No. 218 Fulton st.
REFERENCES.—Messrs. Hopper and Douglas, U. S. Inspectors; Capt. Lord, M. P. Inspector; Messrs. Todd & Rafferty, No. 64 Dey street; New York S. E. Works, Twenty-third street, E. R.; Wash. I. Works, Newburgh. 6 4*

STEAM-BOILER EXPLOSIONS.—NO BOILER should be without one of Ashcroft's Low Water Detectors. Call on or address [4 12*] JOHN ASHCROFT, 50 John st., N. Y.

BOILER FELTING.—STEAM BOILERS, STEAM Pipes, Etc., felted with hair and wool felt, will save 25 per cent of your coal pile. JOHN ASHCROFT, No. 50 John street, is prepared to furnish and put on felting at once. 4 12*

MILL-STONE DRESSING DIAMONDS SET IN Patent Protector and Guide.—Sold by JOHN DICKINSON, Patentee and Sole Manufacturer, and Importer of Diamonds for all mechanical purposes; also Manufacturer of Glaziers' Diamonds, No. 64 Nassau street, New York City. Old diamonds reset. N. B.—Send postage stamp for descriptive circular of the Dresser. 5 12*

THE FIRST AMERICAN-EUROPEAN PATENT CO. (Chartered), of Louisville, Ky., purchases, sells, negotiates, introduces Patents and Inventions throughout both the United States and Europe. Send for circulars or call at the
MAIN BRANCH OFFICE,
4 12* No. 49 Nassau street, New York.

WANTED—AGENTS.—$150 PER MONTH TO SELL the Improved New England Family Sewing Machine. Price $18. The simplest and best machine for family use in the world. Address DANE & CO., P. O. Box 52, Chicago, Ill., or call at Room No. 8, Post-office Block. 4 12

GREAT ECONOMY IN WATER POWER.—LEFFEL'S AMERICAN DOUBLE TURBINE WATER WHEEL, patented by James Leffel, of Springfield, Ohio, Jan. 14, 1862, and reissued Oct. 11, 1864.
The attention of all persons using water as a motor, and especially those with whom economy in water is desirable, is called to this wheel. When properly put in, this wheel is pledged at least to equal in efficiency the best overshot wheel in existence, or no sale. For circulars containing full description address the manufacturers,
4 9* JAS. LEFFEL & CO., Springfield, Ohio.

BOLTS, NUTS, WASHERS, COACH SCREWS, SET Screws, Etc., on hand, for sale by
4 12* LEACH BROTHERS, No. 86 Liberty street, N. Y.

STEAM AND WATER GAGES, BRASS AND IRON Cocks, Valves, Etc.; Wrought-iron, Brass and Galvanized Steam, Gas, and Water Pipe; Boiler Flues, Pipe-fitters' Tools, Ashcroft's and Packer's Ratchet Drills. JOHN ASHCROFT,
4 12* No. 50 John street, N. Y.

© 1866 SCIENTIFIC AMERICAN, INC.

ELDRIDGE'S ANTI-FRICTION WHEELS FOR BELT GEARING—One of the most remarkable inventions of the age, securing a great saving of power in mills, factories, founderies, machine shops, and machinery generally. Rights for ale Send for circular with cuts. Address ELDRIDGE & THATCHER,
8 2* No. 1,106 Market street, Pbiladelphia, Pa.

WILSON'S STEAM TRAPS.—GREAT SUCCESS.—This is a simple, cheap and very effective device for freeing all kinds Steam Apparatus from air and water of condensation. For illustrated Circular containing full intormation send to GREENWOOD PIPE CO., Canal and Walnut Streets, Cincinnati, Ohio.
8 5*

TO INVENTORS, PATENTEES, AND DEALERS IN Light Wares.—Orders for manufacturing in any quantity promptly filled, and models made, by W. X. STEVENS,
8 2* No. 11 Cypress street, Worcester, Mass.

IMPROVED CIRCULAR SAW ARBOR.—THIS IMPROVEMENT is for centering saws on their arbors when the hole in the saw is larger than the arbor. The saw is centered instantly and with precision. It can be attached to any ordinary arbor now in use. State Rights for sale. For further particulars address W. T. & L. H. RAND, Patentees, Manchester, N. H 8 2*

LUMBER CAN BE SEASONED IN TWO TO FOUR days, by Bulkley's Patent, at an average cost of $1 per M. from the green. For circular or information address
7 5* C. H. BULKLEY, No. 124 Superior s', Cleveland, Ohio.

SUPERIOR PATENT DRAW LIME KILN—WILL burn Finishing Lime with any coal or wood—50 per cent saving over all other kilns. Apply to C. D. PAGE,
7 9* Rochester, N. Y.

HARRISON'S BURR MILLS—WARRANTED TO grind of Corn, 48-inch stone, 40 bushels per hour; 36-inch stone, 30 bushels; 30-inch stone, 20 bushels; 20-inch stone, 10 bushels; 12-inch stone, 5 bushels. EDWARD HARRISON,
7 8 New Haven, Conn.

REYNOLDS' TURBINE WATER WHEELS.—GREAT Improvements and Reduction in Prices. The best, cheapest, most reliable, and awarded the Gold medal for superiority. Circulars sent free. GEO. TALLCOT, 170 Broadway. N. Y.,
7 13 Late Tallcot & Underhill

FIRST-CLASS MACHINISTS' TOOLS.—36 INCH Lathes, 32-inch Planers, 48-inch Radial Drill and Bolt Cutter, on hand for instant delivery; 25-inch Lathes, 10-inch Shapers, and 24-inch Planers making. E. & A. BETTS,
7 5 Wilmington, Del.

ATMOSPHERIC TRIP HAMMERS.
Persons intending to erect, or those using hammers, are invited to call and examine Hotchkiss's Patent Hammer, made by CHARLES MERRILL & SONS, No. 556 Grand street, New York. They are very simple in construction require less power and repairs than any other hammer. The hammer moves in vertical slides; each blow is square and in the same place. For drawing or swaging they are unequaled, and many kinds of die work can be done quicker than with a drop. They are run with a belt, make but little noise, and can be used in any building without injuring the foundation or walls. The medium sizes, for working 2 to 4 inch square iron, occupy 28x56 inches floor room. Send for circular giving full particulars. 5 tf

M'CONNELL'S TUBE EXPANDER IS OFFERED to manufacturers of boilers, proprietors of steamers, and railroad managers, as the most superior tool produced for flue work, the saving of time and perfectness of operation being the prominent features. See illustration, Vol. XIV., No. 5. SCIENTIFIC AMERICAN. For information address ROBERT McCONNELL,
5 8* Box 401, Jacksonville, Ill.

OFFICE ENG'E AND SUP'T CHARLESTON AND SAVANNAH R. R., CHARLESTON, S. C., Jan. 6, 1866.
PERSONS INTERESTED IN MACHINES FOR Straightening Railroad Iron are requested to communicate with the subscriber, inclosing description and cost of machine.
5 8 H. S. HAINES, Engineer and Superintendent.

TO ENGINEERS.—INCRUSTATION REMOVED AND PREVENTED.—Baird's Patent Incrustation Preventer and Remover for Steam Boilers, in either Salt or Fresh Water. No invention connected with steam power combines so many advantages as this. The economy in fuel alone, from its use, repays the cost of the preventive.
JAS. F. LEVIN, No. 23 Central Wharf, Boston.
4 12 HAMPSON & COPELAND, No. 95 Maiden Lane, N. Y.

THE WASHINGTON IRON WORKS HAVE ON HAND for sale their Improved Portable Steam Engines, Portable Circular Saw-mills, Gang Saw-mills, Flour and Corn Mills, and manufacture to order all kinds of Steam Engines, Marine Stationary, and Propeller, Railroad Cars and Turn Tables, Iron Steam Vessels and Barges; also, General Machinery, Iron and Brass Castings, Large and Small Forgings, Etc. Address
GEO. M. CLAPP, Treasurer, Newburgh, N. Y.,
Or L. C. WARD, Agent,
No. 55 Liberty street, Room 8, New York. 1 19*

BOLT, SPIKE, AND RIVET MACHINES.—2,000 Bolts of any length, with head of any shape used in the trade, made from inch round or square iron, or under that size, are made per day of ten hours, by one man and boy, on Hardaway's Improved Patent Bolt Machine.
Our Spike Machine, for simplicity, durability, quality, and quantity of work turned out, is unequaled.
Our Rivet Machine is simple, durable, and does good work.
Shop and Territorial Rights for sale by Assignees of Hardaway & Sons WHITE & BUTTERWORTH,
P. O. Box No. 292, Baltimore Md.,
Office No. 2 Exchange Building.
"No. 951 BEACH ST., PHILADELPHIA, Oct. 20, 1865.
"We have this day sold our entire right and title to and interest in, our improved patent Bolt Machine to Messrs. White & Butterworth, Baltimore, Md., to whom all letters of inquiry or orders should be addressed. They are also authorized to manufacture and sell our improved Spike and Rivet Machines. All orders to them will be promptly attended to. [2 tf] HARDAWAY & SONS."

MANUFACTURERS OF PLAIN AND ENGRAVED Hardened Cast-steel Rolls and Chilled Iron Rolls, of any form and size, for rolling Silver, Brass, Copper, Britannia Metal, Etc., with any thing desired in the way of engraving for figured or fancy work.
22 20* BLAKE & JOHNSON, Waterbury, Conn.

WOODWORTH PLANERS—IRON FRAMES TO Plane 18 to 24 inches wide, at $120 to $150. For sale by S. C HILIS No. 12 Platt street, New York. a

FOR BEDSTEAD AND FURNITURE MACHINERY, Friezzing, Shaping and Molding Machines, address J. A. FAY & CO., Cincinnati, Ohio. 3atf

IMMENSE IMPROVEMENT IN STEAM.—W. C. HICKS'S PATENT STEAM ENGINES save 75 per cent in space, weight, friction and parts, with great economy in steam. Adapted to all uses. For circular address the HICKS ENGINE CO.,
23 eowtf No. 88 Liberty street, N. Y.

PLATINA—WHOLESALE AND RETAIL—IN ALL forms, for all purposes. H. M. RAYNOR, Importer, No. 748 Broadway, New York. Platinum Scrap and Ore purchased. 1 5*eow

CAN I OBTAIN A PATENT?—FOR ADVICE AND instructions address MUNN & CO., No. 37 Park Row, New York for TWENTY YEARS Attorneys for American and Foreign Patents Caveats and Patents quickly prepared. The SCIENTIFIC AMERICAN $3 a year. 50,000 Patent Cases have been prepared by M. & Co,

CIRCULAR SAW-MILLS—SINGLE AND DOUBLE—with heavy iron and wood frames, friction feed, and improved head blocks, with Steam Engines adapted to the Mill. Drawing given to set up by. Address, for full description,
3 8* ALBERTSON & DOUGLASS MACHINE CO.,
New London, Conn.

TAYLOR, BROTHERS & CO.'S BEST YORKSHIRE Iron.—This iron is of a superior quality for locomotive and gun parts, cotton and other machinery, and is capable of receiving the highest finish. A good assortment of bars and boiler plates in stock and for sale by JOHN B. TAFT, sole agent for the U. S. and Canadas, No. 18 Batterymarch street, Boston. 1 23*

PORTABLE ENGINES, SUITABLE FOR THE OIL Regions, from 8 to 20-horse power, with large fire place, independent steam feed pump, steam gage, and improved water heater. The most complete and best engines in the market. For particulars address WM. D. ANDREWS & BRO.,
1 tf No. 414 Water street, N. Y.

M. H. TILDEN. C. W. MOULTON.
TILDEN & MOULTON, ATTORNEYS AT LAW, Office No. 17½ West Third street, Selves Building, Cincinnati, Ohio. 3 12*

HOLSKE & KNEELAND, MODEL MAKERS. PATENT Office Models, Working Models and Experimental Machinery, made to order at 528 Water street, near Jefferson street, New York. Refer to Munn & Co., SCIENTIFIC AMERICAN Office. 1tf

FOR WOODWORTH PATENT PLANING AND MATCHING MACHINES, Patent Siding and Resawing Machines address J. A. FAY & CO., Cincinnati, Ohio. 3 1y

MACHINERY AND TOOLS OF ALL KINDS AT lowest prices. BARAGWANATH & VAN WISKER,
European and American Tool Agents, 200 Broadway, N. Y.
Branch offices—London, Paris, and Melbourne. 6 tf

FOR SALE—UPWARDS OF TWENTY VALUABLE Patents. Particulars in our Illustrated Catalogue.
BARAGWANATH & VAN WISKER, 200 Broadway, N. Y.
Branch offices—London, Paris and Melbourne. 6 tf

ANDREWS' PATENT OSCILLATING ENGINES.—Double and Single Engines, from ¼ to 125-horse power, finished at short notice. These engines leave the shop ready for use; require no special foundation; are compact, light and simple, and economical of power. For descriptive pamphlets and price list address the manufacturers, W. D. ANDREWS & BRO.,
1 tf No. 414 Water street, N. Y.

GROVER & BAKER'S HIGHEST PREMIUM ELASTIC Stitch Sewing Machines, 495 Broadway, New York 1 tf

SETS, VOLUMES AND NUMBERS.
Entire sets, volumes and numbers of SCIENTIFIC AMERICAN Old and New Series) can be supplied by addressing A. B. C., Box No 773, care of MUNN & CO., New York. 5 tf

JUST PUBLISHED—THE INVENTORS' AND MECHANICS' GUIDE.—A new book upon Mechanics Patents and New Inventions. Containing the U. S. Patent Laws, Rules and Directions for doing business at the Patent Office; 112 diagrams of the best mechanical movements, with descriptions; the Condensing Steam Engine, with engraving and description; How to Invent; How to Obtain Patents; Hints upon the Value of Patents; How to Sell Patents; Forms for Assignments; Information upon the Rights of Inventors, Assignees and Joint Owners; Instructions as to Interferences, Reissues, Extensions, Caveats, together with a great variety of useful information in regard to patents, new inventions and scientific subjects, with scientific tables, and many illustrations. 108 pages. This is a most valuable work. Price only 25 cents. Address MUNN & CO., No. 37 Park Row N. Y. 14 tf

M. BAILEY & CO., PROVISION BROKERS, NO. 40 West Fourth street, Cincinnati. Orders for Provisions, Lard, Tallow, Grease, Oils, etc., carefully and promptly filled.
XIII 16 44*

EMERY PAPER AND CLOTH, AND FLINT SAND Paper, all grades and lengths.
Ground Emery and Ground Flint or Quartz—all sizes; Glue for all purposes; Curled Hair; Plastering Hair; Surfing Hair; Rawhide Whips; Rawhide Cord; Rope; Rawhide cut to any size; Bones and Bonedust; Neat's Foot Oil—for sale by the manufacturers,
BAEDER & ADAMSON,
23 13* Stores { No. 67 Beekman street, New York, and No. 730 Market street, Philadelphia.

J. A. FAY & CO.,
CINCINNATI, OHIO,
Patentees and Manufacturers of all kinds of
PATENT WOOD-WORKING MACHINERY
of the latest and most approved description,
particularly designed for
Navy Yards, Sash, Blind and Door,
Ship Yards, Wheel, Felly and Spoke,
Railroad, Stave and Barrel,
Car and Shingle and Lath,
Agricultural Shops, Planing and Resawing,
Mills, Etc.
Warranted superior to any in use. Send for Circulars.
For further particulars address J. A. FAY & CO.,
Corner John and Front streets,
Cincinnati, Ohio,
Who are the only manufacturers of J. A. Fay & Co.'s Patent Wood working Machinery in the United States. 3 1y

OIL! OIL! OIL
For Railroads, Steamers, and for machinery and Burning, PEASES Improved Engine Signal, and Car Oils, indorsed and recommended by the highest authority in the United States and Europe, This Oil possesses qualities vitally essential for lubricating and burning, and found in no other oil. It is offered to the public upon the most reliable, thorough, and practical test. Our most skillful engineers and machinists pronounce it superior to and cheaper than any other, and the only oil that is in all cases reliable and will not gum. The "Scientific American," after several tests, pronounces it "superior to any other they have used for machinery." For sale only by the Inventor and Manufacturer, F. S. PEASE, No 61 and 63 Main street, Buffalo, N. Y.
N. B.—Reliable orders filled for any part of the world. 1tf

PORTABLE STEAM ENGINES—COMBINING THE maximum of efficiency, durability, and economy with the minimum of weight and price. They are widely and favorably known, more than 300 being in use. All warranted satisfactory or no sale. Descriptive circulars sent on application. Address J. C. HOADLEY & CO., Lawrence, Mass. 1 tf

$1,500 PER YEAR!—WE WANT AGENTS every where to sell our improved $20 Sewing Machines. Three new kinds. Under and upper feed. Warranted five years. Above salary, or large commissions, paid. The only machines sold in United States for less than $40, which are fully licensed by Howe, Wheeler & Wilson, Grover & Baker, Singer & Co., and Bachelder. All other cheap machines are infringements. Circulars free. Address, or call upon Shaw & Clark, Biddeford, Maine. 25 15*

GODDARD'S BURRING MACHINE WORKS,
Office, No. 3 Bowling Green, New York,
manufacture the
Patent Steel Ring and Solid Packing
BURRING MACHINES,
Patent Mestizo Wool-burring Pickers, Shake Willows, Wool and Waste Dusters, Gessner's Patent Gigs, Etc.
Orders respectfully solicited, and prompt attention given, by addressing C. L. GODDARD,
23 13* No. 3 Bowling Green, N. Y.

A MESSIEURS LES INVENTEURS.—A VIS IMPORTANT Les inventeurs non familiers avec la langue Anglaise, et qui préféreraient nous communiquer leurs inventions en Français peuvent nous addresser dans leur langue natale. Envoyez nous un dessin et une description concise pour notre examen. Toutes communications seront regues en confidence. MUNN & CO.,
Scientific American office, No. 37 Park Row New York.

THE MOST VALUABLE MACHINE FOR BUILDERS and Carpenters, Furniture, Carriage, Agricultural Implement, Sash and Door, Waived and Straight, Molding and Piano Manufacturers, complete for all kinds of irregular and straight work in wood, hard or soft, superior to all others, having the capacity of 20 good mechanics, called the Variety Molding and Planing Machine. We own 9 patents, covering the valuable inventions for machines with upright mandrels. Have them manufactured in one place only for the United States and Europe, viz.: at Plass Iron Works, No. 110 East Twenty-ninth street, New York. We hear there are parties manufacturing machines infringing on some one or more of our patents. We caution the public from purchasing such infringements. Our patents secure to us the machine with either iron or wooden table, through which are two upright mandrels, having cutters in each head held by a screw nut; also, combination collars, saving 75 per cent in cutters, feed table to plane end cut, irons outside the cutters, preventing wood from taking undue hold. Also guards acting as plane stocks, making it safe for a boy to run.
Agents solicited. Please send for circular giving full description.
Information or orders for machine may be addressed COMBINATION MOLDING AND PLANING MACHINE COMPANY, New York City. 1 9*

BUERK'S WATCHMAN'S TIME DETECTOR.—IMPORTANT for all large corporations and manufacturing concerns—capable of controlling with the utmost accuracy the motions of a watchman or patrolman, as the same reaches different stations of his beat. Send for a circular.
J. E. BUERK,
23 26* P. O. 1,057, Boston, Mass

CIRCULAR SAW-MILLS.—THE UNDERSIGNED are now manufacturing Circular Saw-mills of all sizes, with solid iron or heavy wood frame suitable for the Southern market. Also, Sugar Mills, vertical or horizontal; Steam Engines and Boilers, stationary or portable; Brick Machinery; Mill Gearing, and Iron and Brass Castings of every description.
For particulars address CORWIN, STANTON & CO.,
24 12* Newburgh Steam Engine Works, Newburgh, N. Y.

INDICATOR APPLIED TO STEAM ENGINES TO ascertain their condition and power, also to determine the amount of power used by tenants. F. W. BACON,
8 12 Consulting Engineer, No. 84 John street, N. Y.

INVENTORS' HEADQUARTERS, INVENTORS' AGENCY, and N. Y. Mfg. Co., 37 Park Row, N. Y., having been established for several years, have superior facilities for manufacturing new articles and selling patents on com. Send stamp for circular. 6tf

STEAM ENGINES—WITH LINK MOTION, VARIABLE automatic cut-off, of the most approved construction; Mill Gearing, Shafting, Hanger, Etc. Address M. & T SAULT,
7 26 New Haven, Conn.

N. C. STILES'S PATENT POWER FOOT AND DROP PRESSES.—Dies of every description made to order. Send for a circular N. C. STILES & CO.,
1 Vol. XIII. 52* West Meriden, Conn.

FOR DANIELLS'S PLANING MACHINES, CAR MORTISING, Boring Machines, Car-Tenoning Machines, Car Planing and Beading Machines, Etc., address J. A. FAY & CO., Cincinnati Ohio 3 1y

IRON PLANERS, ENGINE LATHES, DRILLS AND other machinists' tools, of superior quality, on hand and finishing, for sale low. For description and price address NEW HAVEN MANUFACTURING COMPANY New Haven, Conn.

ANDREWS' PATENT CENTRIFUGAL PUMPS—CAPACITY from 90 to 40,000 gallons per minute. For draining and irrigating lands, wrecking, coffer dams, condensers, cotton, wool and starch factories paper mills, tanneries, and all places where a large and constant supply of water is required, these pumps are unequaled. They are compact, require little power, and are not liable to get out of order. For descriptive pamphlet address
1 tf W. D. ANDREWS & BRO., No. 414 Water street, N. Y.

DAMPER REGULATORS—GUARANTEED TO EFFECT a great saving in fuel, and give the most perfect regularity of power. For sale by the subscribers, who have established their exclusive right to manufacture damper regulators, using diaphragms or flexible vessels of any kind. CLARK'S PATENT STEAM AND FIRE REGULATOR COMPANY, No. 117 Broadway, New York. XIII 10 26*

FOR SALE—ENGINES, BOILERS, AND STEAM PUMPS, both new and second-hand, at 167 to 175 Water street, Brooklyn. FINNEY & HOFFMAN, Dealers in Machinery 1 10*

WHEELER & WILSON, 625 BROADWAY, N. Y.—Lock-stitch Sewing Machine and Button-hole Machine. 1tf

VALUABLE ROLLING MILLS FOR SALE—SITUATED on the west side of Second avenue, between Forty sixth and Forty-seventh streets, comprising two Trains of Rolls, three Steam Engines and Boilers, Heating Furnaces, and all the Machinery necessary for carrying on a large and profitable business in the manufacture of iron or steel. These works have lately been put in thorough working order, and are ready to start at once.
Also, connected with the above, a Crucible Manufactory.
For further information apply to SAML. MULLIKEN & CO.,
26 tf Agents, No. 159 Front street, New York.

SALE OF CONDEMNED ORDNANCE STORES

Will be sold at Public Auction, at Indianapolis Arsenal, Indianapolis, Indiana, on the 20th day of February, 1866, at 10 o'clock A. M., a large quantity of Ordnance Stores of inferior quality, consisting in part of the following articles, viz:—

974	Carbines, various kinds.
36,000	Muskets and Rifles, new and old, United States and foreign, of various calibers.
503	Starr's Army Revolvers, serviceable.
276	Savage's Navy Revolvers, new and others; with a large lot of Spare Parts for the repair of small arms of various patterns.
430	Cavalry Saber Belts, worn.
724	Cavalry Saddles, worn.
1,090	Cavalry Bridles, worn.
288	Belt Holsters for Pistols, worn.
200	Cartridge boxes for Pistols. worn.
153	Cartridge Boxes for Carbines, worn.
300	Slings for Carbines, worn.
158	sets of Artillery Harness, worn.
4,000	sets of Infantry Accouterments, worn.

Also a large lot of Appendages for the various kinds of Muskets and Rifles.
Samples to be seen at the Indianapolis Arsenal, and at the United States Ordance Agency, No. 45 Worth street, New York City
Terms of Sale—CASH. JAS. N. WHITTEMORE,
4 6 Capt. and Brevet Maj. Ord., Commanding

Zur Beachtung für deutsche Erfinder.

Die Unterzeichneten haben eine Anleitung, die Erfindern das Verhalten angibt, um sich ihre Patente zu sichern, herausgegeben, und verabfolgen solche gratis an dieselben.
Erfinder, welche nicht mit der englischen Sprache bekannt sind, können ihre Mittheilungen in der deutschen Sprache machen. Skizzen von Erfindungen mit kurzen, deutlich geschriebenen Beschreibungen beliebe man zu adbressiren an
Munn & Co.,
37 Park Row, New-York.
Auf der Office wird deutsch gesprochen.
Daselbst ist zu haben:

Die Patent-Gesetze der Vereinigten Staaten,

nebst den Regeln und der Geschäftsordnung der Patent-Office und Anleitungen für den Erfinder, um sich Patente zu sichern, in den Ver. Staaten sowohl als in Europa. Ferner Auszüge aus den Patent-Gesetzen fremder Länder und darauf bezügliche Rathschläge; ebenfalls nützliche Winke für Erfinder und solche, welche patentiren wollen.
Preis 20 Cts., per Post 25 Cts.

© 1866 SCIENTIFIC AMERICAN, INC.

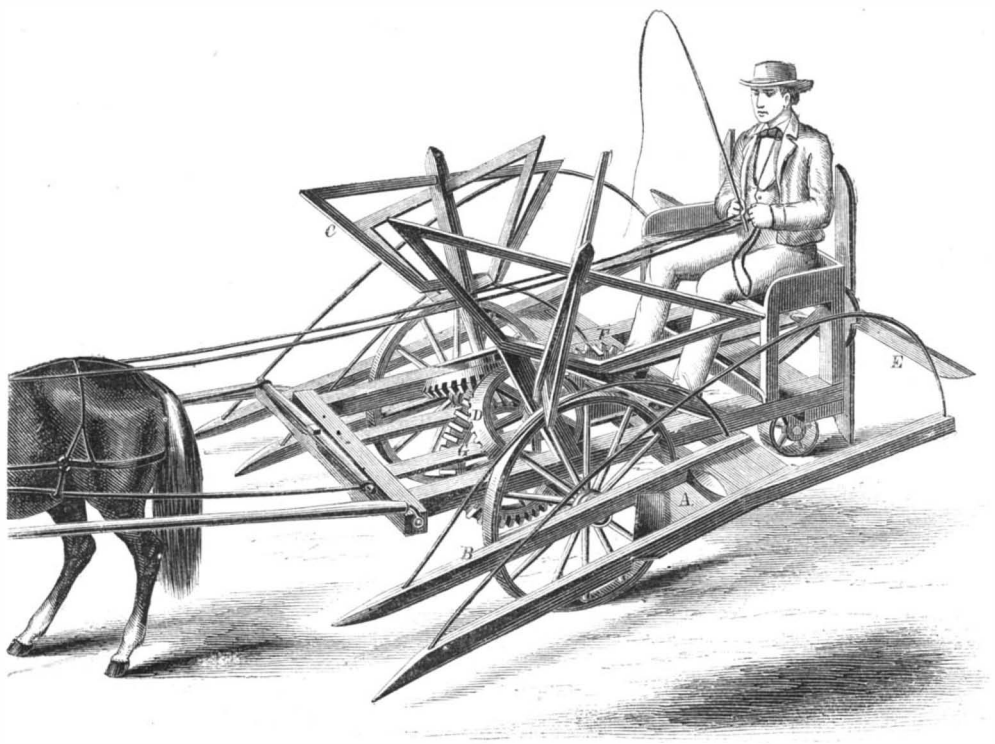
Improved Corn Harvester.

This engraving represents a machine for harvesting corn in the stalk, or for cutting it as it grows, so that it can be gathered and stacked with but little labor. It is intended to cut two rows at once, and the driver has merely to sit still and guide the team or the horse while the machine does the work.

In detail, the machine consists of two knives, A, between the guide bars, B. These guides are, practically, two forks, which go between or on each side of the hills, so as to bring the stalks within them.

There are, further, two reels, C, one at each side, which receive rotary motion from gearing, D, in the center. The object of these is to bring the stalks up as they are turned over by the advance of the team, so that, as they strike the knives and slide laterally along the edges, they will be cut off. On each side are two guides, B, having two bows that catch the stalks and bring them gradually to the rear, where there are two carriers, E. These revolve at the will of the driver, and consist of arms on which the stalks fall until a quantity have gathered there. This load is then discharged by the machine itself—the mechanism for the purpose being merely a wheel, F, in front of the driver, armed with pins projecting at certain intervals, which are operated by others in the gear, G, and cause the arms of the carrier to revolve a quarter round and drop the load, as before described. The main wheels carrying the machine are fitted with ratchet teeth and a pawl, so that they only operate when going forward. This arrangement aids the machine in turning a sharp corner, for one of the wheels is stationary while the other revolves. It is claimed that a man and one horse can cut twelve acres of corn a day in a perfect manner with this machine.

Patented through the Scientific American Patent Agency on Feb. 6, 1866, by Theodore Butterworth. Parties desiring Stats rights or manufacturere having facilities may address the inventor for further information at Shelbyville, Mo.



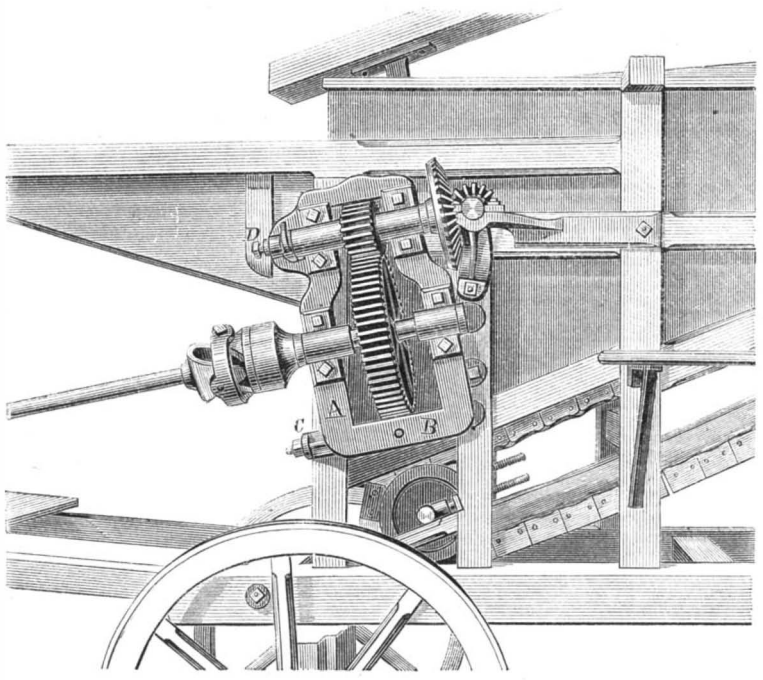
BUTTERWORTH'S CORN HARVESTER.

Gearing for Thrashing Machines.

The engraving published herewith, shows an improved method of adjusting gearing on thrashing machines, so that it is always kept in line, and thereby runs easier and longer without adjustment or repair. This refers particularly to the cylinder shaft, and the bevel wheel shaft. The former wears downward, while the latter wears upward. This causes the gears to jam or run out of mesh, making the parts run stiffly and entailing loss of power. The trouble is obviated by this arrangement and the gears can be quickly adjusted so as to always run true. The details are as follows: The frame, A, the gears are fitted to, has two lugs on the upper part; through one of these lugs a bolt passes into the frame; in the other there is a curved slot, so that the whole frame can be moved to accommodate the wear. In the lower part of the frame, as at B, there is a curved bar, C, which has a bolt and nut. By turning this nut, when the other parts above are slacked off, the frame can be adjusted as stated.

If the bevel wheel is out of mesh with the pinion aforesaid, or does not mesh deep enough, the difficulty can be remedied by a set screw, D, at the end, which allows the shaft it is on to be moved in or out as circumstances may require. The engraving shows only the gearing of the cylinder shaft, the rest of the machine being omitted as not essential.

The invention was patented on Jan. 16, 1866, through the Scientific American Patent Agency, by L. B. Hubbell, of Alton, Ill.; address Hanson & Co., at that place, for further information.



HUBBELL'S GEARING FOR THRASHING MACHINES.

Bessemer Steel Rails.

On the occasion of the discussion of Mr. Bessemer's paper, read before the Mechanical Engineers at Sheffield, in 1861, Mr. John Brown, of the Atlas Works, expressed the opinion that the cost of Bessemer rails was not likely to become diminished to much below what he then sold them at, namely, £22 per tun. The value of a manufacturing process depends greatly, of course, upon the cheapness with which the manufactured article is produced, and thus the Bessemer process has proved much more successful than the great Sheffield armor-plate maker had expected; for not long since the Metropolitan Railway Company were obtaining Bessemer rails at £17 per tun, and we have lately heard of quotations as low as £12. As for prime cost, it is difficult to see why Bessemer rails should cost more than, if as much as, those rolled of iron.

The pig iron required for the pneumatic process is of a costlier quality, but there is less waste than in puddling and reheating; the proportion of waste at the Bessemer works of the London and North-Western Railway Company, at Crewe, not exceeding, we believe, 15 per cent, while much of the so-called waste is really workable metal. In South Staffordshire a consumption of 1 tun 5 cwts. of pig iron to 1 tun of finished bars is reckoned good work, and with other kinds of iron, in Wales, from 28 cwts. to 31 cwts. of pigs go to the tun of railway bars. The Bessemer plant is costly also, but its power of production is enormous. It takes but 12 minutes or so to blow a charge of almost any weight—say 5 tuns to to 7½ tuns—and the converters, although the ganister requires a little mending as the work goes on, bear one hundred or more rounds before requiring to be relined. —*Engineering.*

THE address of Mr. Snell, the inventor of the swarm alarm, illustrated on page 46 of the current volume, is Rushford, Minnesota, not Maine.

MECHANICS

INVENTORS, MANUFACTURERS

The SCIENTIFIC AMERICAN is the largest and most widely circulated journal of its class in this country. Each number contains sixteen pages, with numerous illustrations. The numbers for a year make two volumes of 416 pages each. It also contains a full account of all the principal inventions and discoveries of the day. Also, valuable illustrated articles upon Tools and Machinery used in Workshops, Manufactories, Steam and Mechanical Engineering, Woolen, Cotton, Chemical, Petroleum, and all other manufacturing and producing interests. Also, Fire-arms, War Implements, Ordnance, War Vessels, Railway Machinery, Electric, Chemical, and Mathematical Apparatus, Wood and Lumber Machinery, Hydraulics, Oil and Water Pumps, Water Wheels, Etc.; Household, Horticultural, and Farm Implements—this latter department being very full and of great value to Farmers and Gardeners. Articles embracing every department of Popular Science, which every body can understand and which every body likes to read.

Also, Reports of Scientific Societies, at home and abroad, Patent-law Decisions and Discussions, Practical Recipes, Etc. It also contains an Official List of all the Patent Claims, a special feature of great value to Inventors and owners of Patents.

Published Weekly, two volumes each year, commencing January and July.

TERMS.

Per annum.....$3 00
Six months..... 1 50
Ten Copies for One Year.....25 00

Canada subscriptions, 25 cents extra. Specimen copies sent free, Address

MUNN & CO., Publishers,
No. 37 Park Row, New York City

Messrs. MUNN & CO. have had twenty years' experience in procuring Patents for New Inventions. Inventors who may have such business to transact can receive, free, all needful advice how to proceed.

FROM THE STEAM PRESS OF JOHN A. GRAY AND GREEN

© 1866 SCIENTIFIC AMERICAN, INC.